OCTOBER 10, 1931

Railway Age

Founded In 1856

ECONOMY

The question uppermost in the minds of all Railway Officers.

HEADFREE RAIL

Service in track has proven that the use of Headfree Rail results in the greatest maintenance economy of the past fifty years.

Look for latest service results in Railway Age issues of October 17th and November 7th.

THE THOMSON RAIL CORPORATION
OF NEW YORK

Pennsylvania Building, Philadelphia

Patented in the United States and Canada. License to roll Headfree Rail may be had by the railroads from The Thomson Rail Corporation of New York

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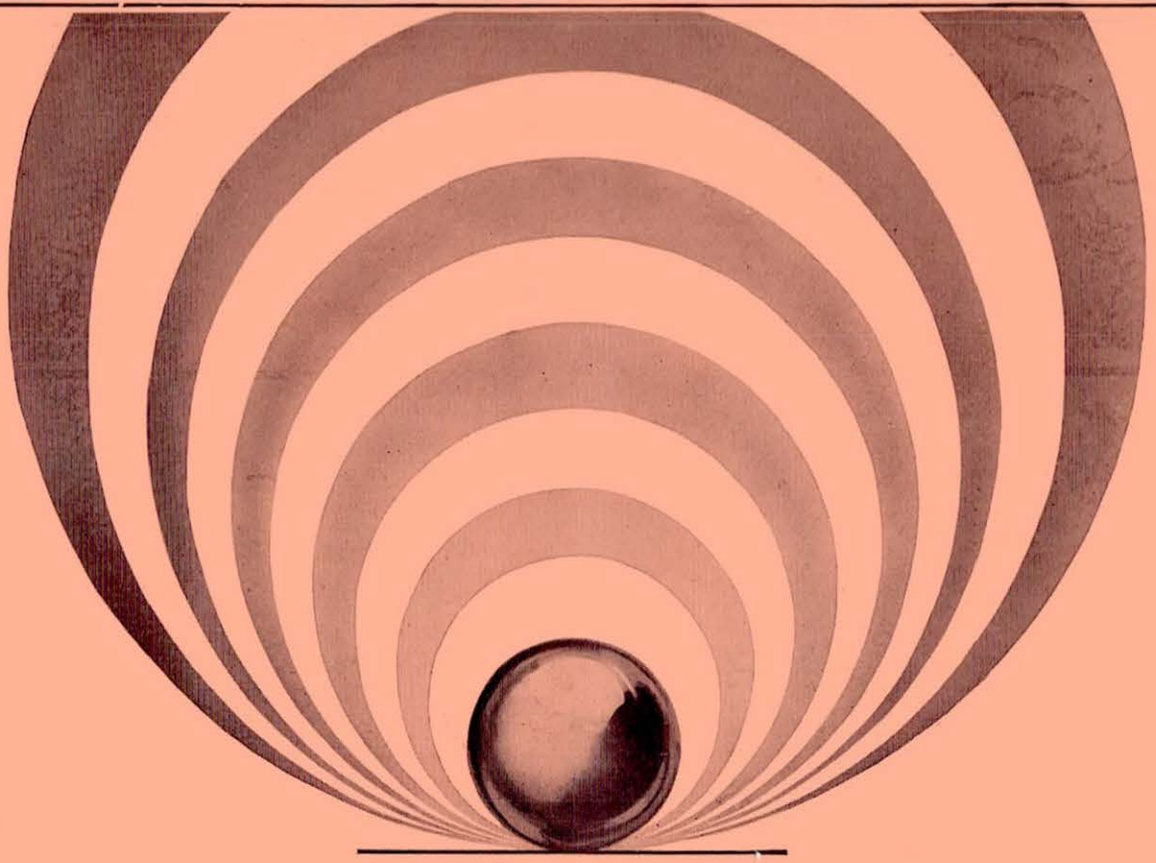

SIMPLICITY

It has been said that simple things are hardest to do and most worth while when done.

In designing a car door fixture to be an improvement over other designs CRECo remembered the need for simplicity.

CRECo Ball Bearing Door Fixtures have no parts to oil, no rollers to wear flat, no pins to wear or to be machined, no bushings. Rust, snow or ice do not hinder their one-hand operation.

Placing a ball carriage between the car door and the track was a simple thing to do. Our customers tell us that the doing so was worth while.

Chicago Railway Equipment Co.

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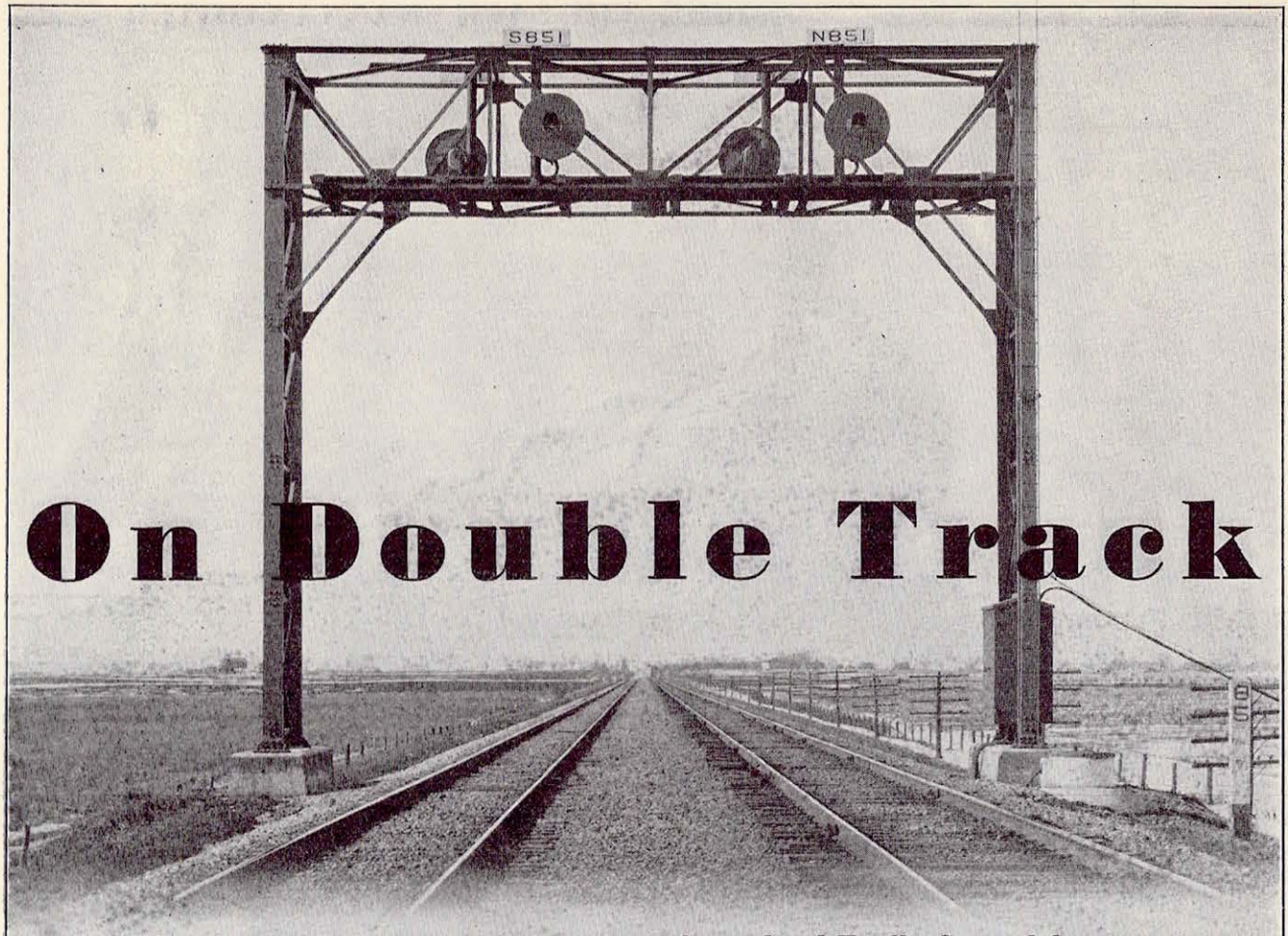

On Double Track

The General Railway Signal Company's Centralized Traffic Control System is providing the most flexible means yet made available for handling traffic on double track. With this system trains are moved from one track to another so that best advantage can be taken of unoccupied sections. Approaching terminals, where congestion often occurs, superior trains are run around inferior trains without delay to either. On long up grades fast trains are routed around tonnage trains. Passing sidings are often eliminated — power operated high speed crossovers and controlled "either direction" signaling give maximum facility of movement. Trains are speeded up through yard limits by the operator directing trains by signal indication around sections given over to switching.

Over important short stretches or entire divisions, and on single or multiple track lines, as well as on double track, the G-R-S Centralized Traffic Control System is demonstrating its remarkable effectiveness in reducing operating expenses and increasing the output of transportation.

GENERAL RAILWAY SIGNAL COMPANY

ROCHESTER, N. Y.

A-788

THE LACKAWANNA LIMITED

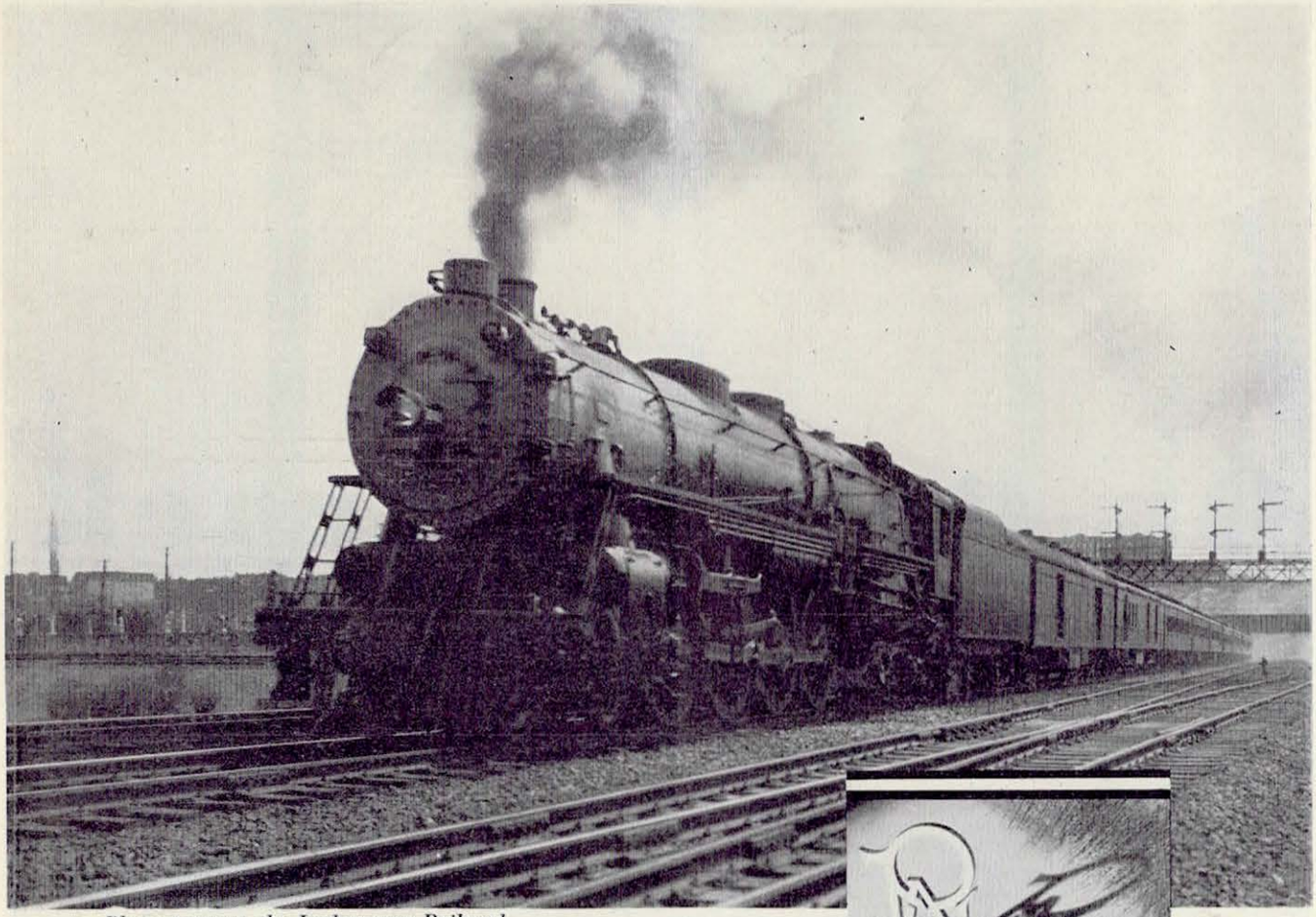

Photo courtesy the Lackawanna Railroad

Powerful locomotives on the Lackawanna Limited, and other well-known trains of the Delaware, Lackawanna and Western Lines, use Pyle-National headlights and turbo-generators. The design, materials, and construction are the best . . . that's why Pyle-National railway electrical equipment is used on the Lackawanna railroad . . . and on a great majority of all other railroads too. Write for special bulletins describing complete line.

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Builders Exchange Building St. Paul, Minn.
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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office

Vol. 91 October 10, 1931 No. 15

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Article No. 14 of the Operating Economy Series, which tells how labor costs may be materially reduced by providing equipment for fighting snow storms and by using mechanical and chemical means for eradicating weeds.

Four-System Plan Submitted to I. C. C. 549

A summary of the final agreement for consolidation of Eastern railroads, exclusive of those in New England, as submitted to the Interstate Commerce Commission on October 3 by four trunk-line executives.

Freight Car vs. Motor Truck 558

An analysis of comparative shipping costs, by rail and highway, between New York and Philadelphia, taken from a survey by Russell W. Talbot, Strathcona Memorial Fellow in Transportation, Yale University.

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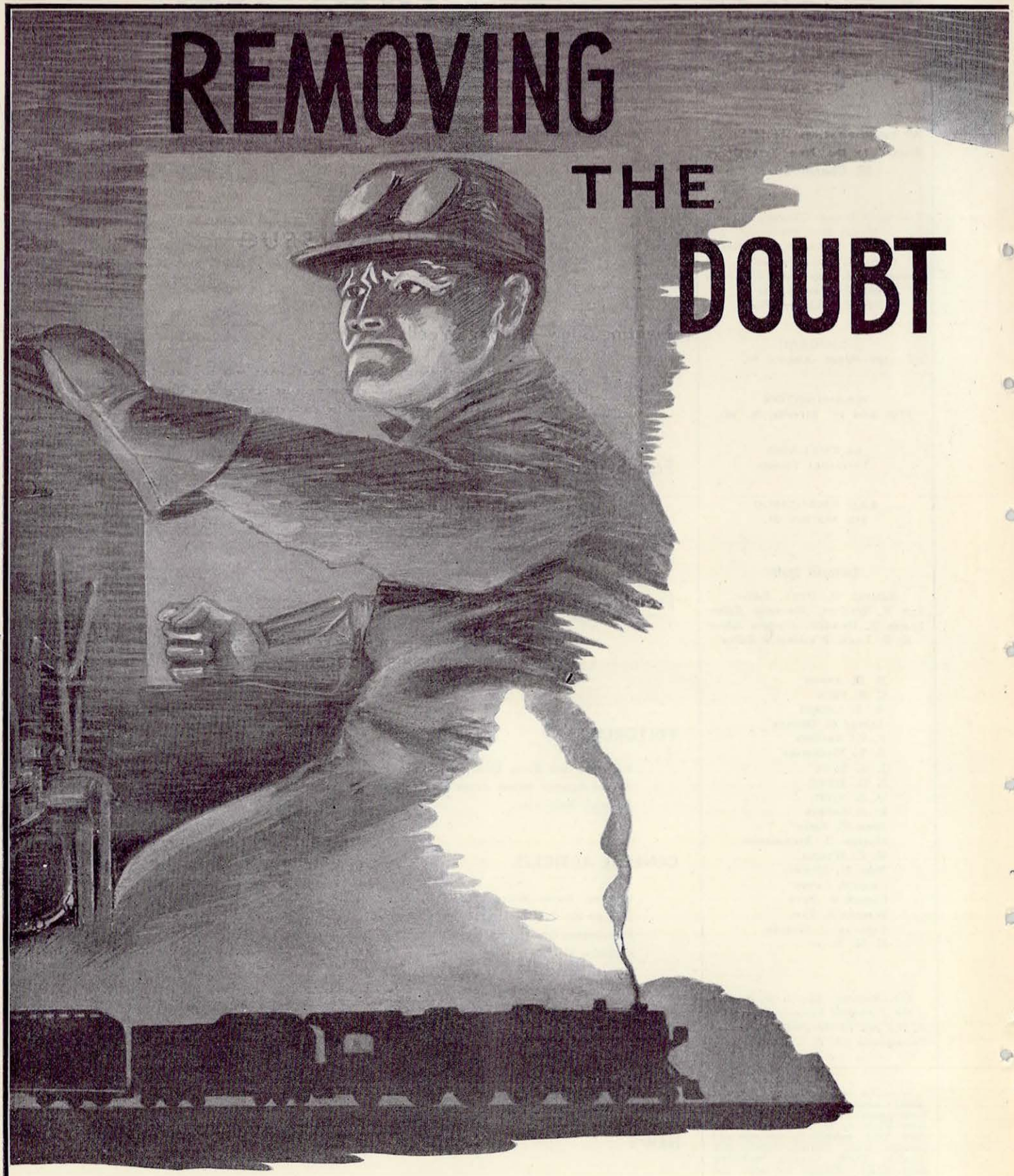

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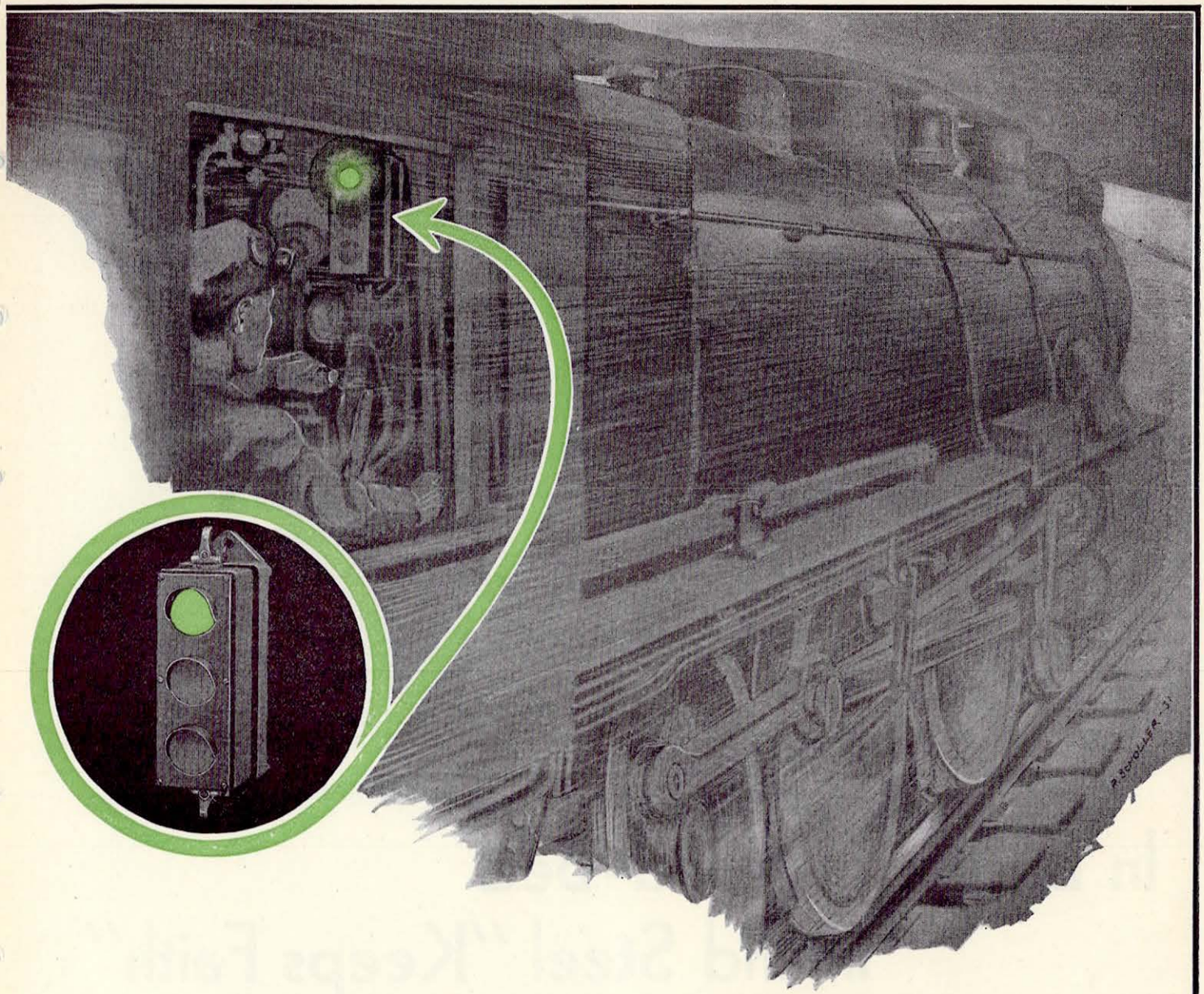

No longer hindered by nature's handicaps of fog, rain, sleet and snow, the engineman now brings his train through on scheduled time. He no longer fears missing wayside signal indications because his view has been cut off by conditions of the elements or physical characteristics of the roadway. It is no longer necessary for him to grope his way through fogs or other elements in futile attempts to maintain schedules. No longer does he function under a constant strain or doubt. "UNION" CONTINUOUS CAB SIGNALS HAVE REMOVED THE BLINDFOLD! Continuously controlled and constantly visible, the engineman has a CONTINUOUS signal before him showing the condition of every foot of track ahead. » » » » » »

Many other economic and operating advantages derived through installation of "Union" Continuous Cab Signals will gladly be explained by our nearest district office. There is no obligation. » » » » » » »

1881 TRADE MARK **Union Switch & Signal Co.** TRADE MARK 1931

SWISSVALE, PA.

In Bridge or Road-Bed Inland Steel "Keeps Faith"

Too much emphasis cannot be placed on the importance of the great railroad bridges which span dizzy depths. Here strength and safety are paramount and here Inland Steel plays its part. In no less degree Inland Rails and Track Accessories are found "keeping faith" on the road-beds of the great systems of the Central West.

Inland has accepted the responsibilities attached to producing steel for railroad applications. And every Inland worker realizes his personal share of the obligation. This watchful care of individuals combined with the best production facilities obtainable, and exacting scientific tests at every step from mine to finished product has built Inland's standing as a producer of steel that "keeps faith." INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago, Illinois.

Save with Steel

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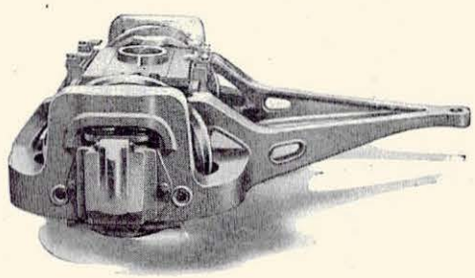
RAILS THAT KEEP FAITH

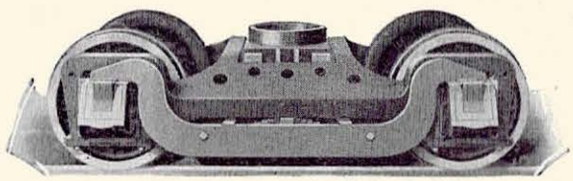
SOLVE YOUR LOCOMOTIVE TRUCK PROBLEMS

BY USING

Commonwealth Engine and Trailer Trucks



Two-wheel Engine Truck

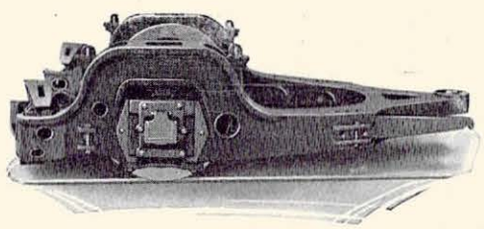


Four-wheel Engine Truck

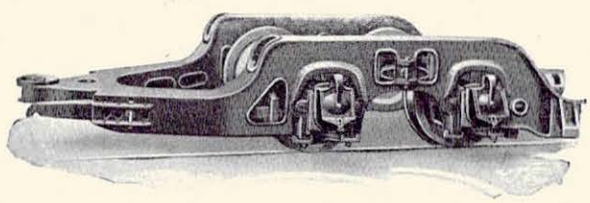
OUTSIDE JOURNAL ENGINE TRUCKS

Facilitate Inspection and Lubrication

Commonwealth Engine and Trailer Trucks
have one-piece frames with integral pedestals
and positive (rocker type) centering device.



Two-wheel Delta-type Trailer Truck



Four-wheel Delta-type Trailer Truck

DELTA-TYPE TRAILER TRUCKS

Equalized with Drivers, insuring flexibility
and easy riding

EFFICIENCY ECONOMY

GENERAL STEEL CASTINGS CORPORATION

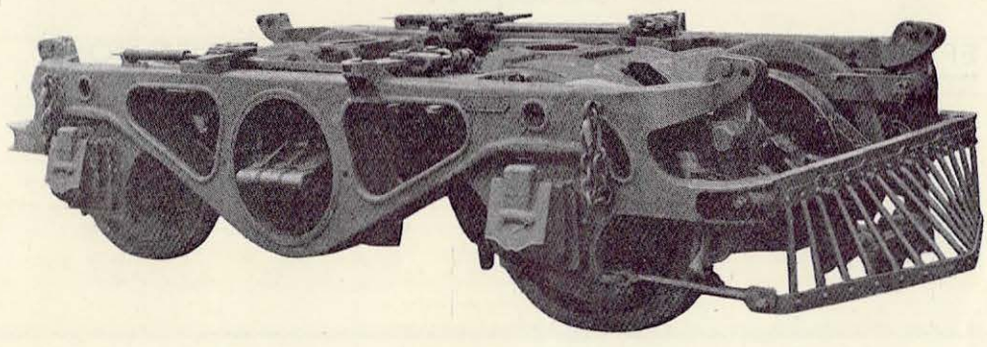
EDDYSTONE, PA. GRANITE CITY, ILL.

Trucked for Endurance

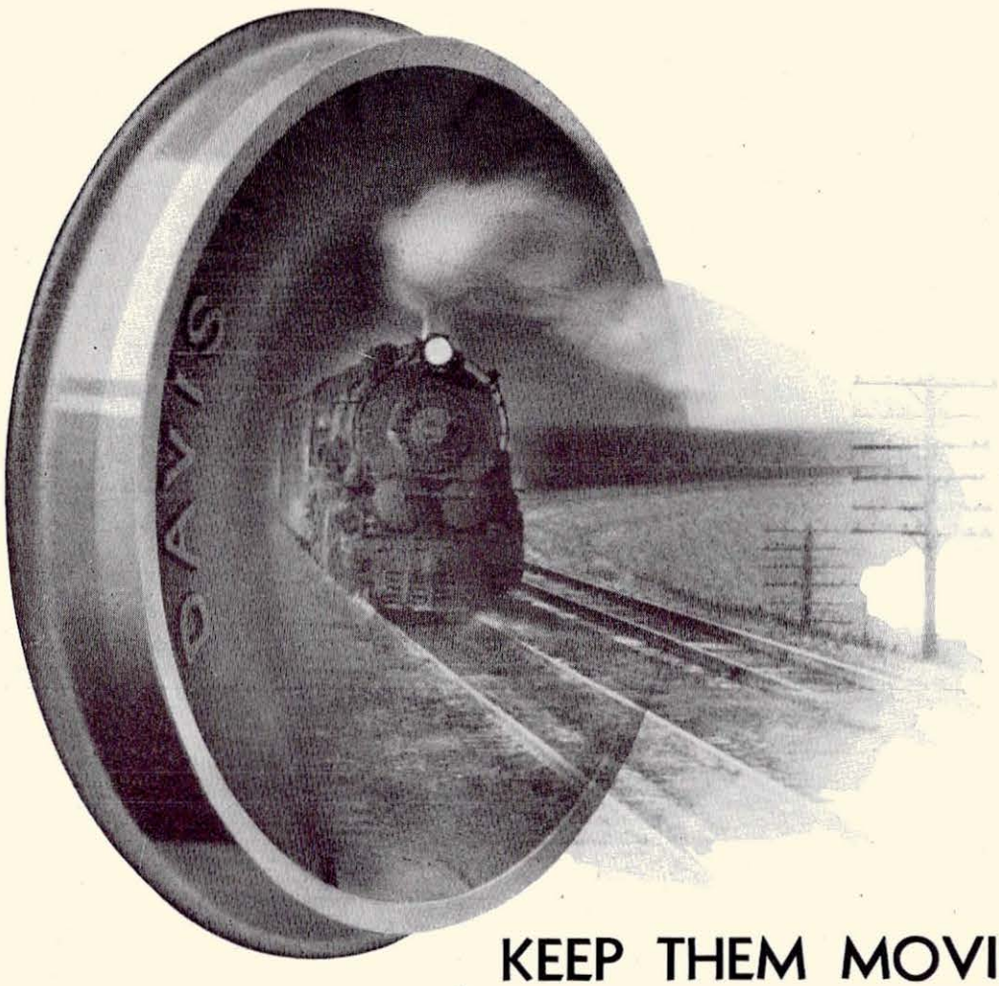
Of the seventy new multiple unit electric cars recently constructed for the Reading Company's suburban electrification, fifty were equipped with the improved Taylor flexible truck—whose steel members were patterned, cast and machined complete by Birdsboro.

Rapid acceleration and high schedule speeds, made possible through two 300 hp. motors mounted in series, exacts great strength from the Taylor units which in addition supply easier riding qualities, lower operating cost, greater safety and less vertical impact.

Birdsboro's steel foundry division caters to the many wants of the railroad, from specialization to the standard in both car and locomotive castings.



DAVIS "ONE-WEAR" STEEL WHEELS



KEEP THEM MOVING!

Keep cars moving! Moving cars mean revenue. At the lowest figure a car is worth a dollar a day. It wastes these dollars when out of service waiting for wheel re-turning • • • • •

One of the results of using Davis "One-Wear" Steel Wheels is to increase the availability of equipment by eliminating contour conditioning • • • • • • • • •

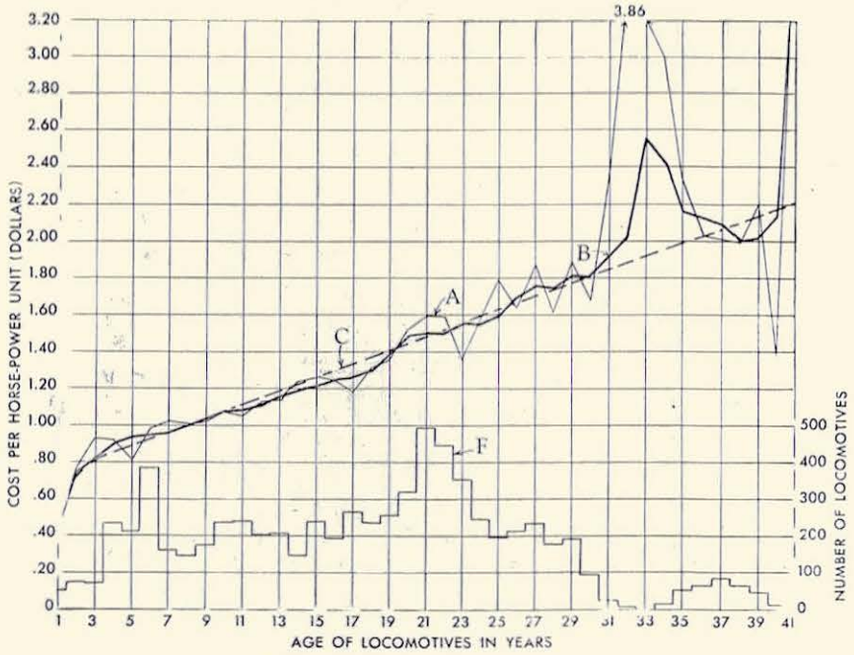
Davis "One-Wear" Steel Wheels are made from a special composition steel triple heat treated which enables them to develop full life without re-turning • • • • • • •

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

What is Economy?

"Cheapness of operation, relative or absolute, as expressed in steam, fuel, or money." — *Standard Dictionary.*



THE above chart shows the increasing cost of maintenance with advancing physical age of locomotives per unit of work (10,000 boiler horse-power miles).

Curve A shows the varying cost from year to year.

Curve B is a five-year moving average of Curve A.

Curve C is a straight-line projection.

Curve F represents the number of locomotives considered in the Curves A, B and C. The total is 2752 locomotives operating on five railroads, and representing 7182 locomotive repair years.

From the third year on, there is an average annual increase in maintenance cost of about 3½ per cent.

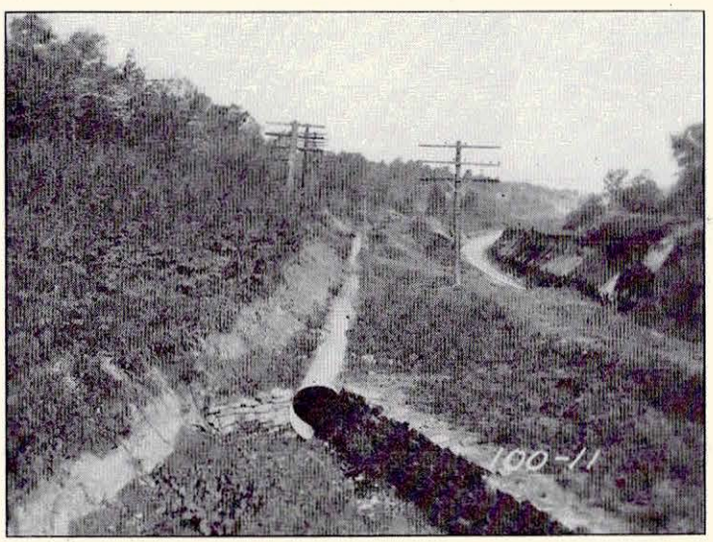
Some time after the twenty-fifth year, there is a tendency for such costs to rise 'way above the trend.

It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS 1831 1931

THE
BALDWIN
LOCOMOTIVE WORKS
PHILADELPHIA

Enclose troublesome streams with ARMCO *Corrugated* PIPE *and forget them*



Harnessing a stream near a railroad in Kentucky with an Armco Culvert. This 36-inch corrugated metal culvert was used to enclose surface ditch on west side of a 25 foot cut.

FOR stream enclosures, Armco Corrugated Iron Pipe should be the maintenance man's first choice. Its record of 25 years, to date, of trouble-free service in this capacity is something which cannot be said for any other type of drainage material. Harnessing and controlling troublesome streams is one of its major functions. ***Simply lay the pipe—then forget the stream.***

Armco Corrugated Pipe is easy to install either as an original stream enclosure under tracks or as a replacement for existing trestles and small span bridges. Its use assures prolonged safety at low cost per year of service.

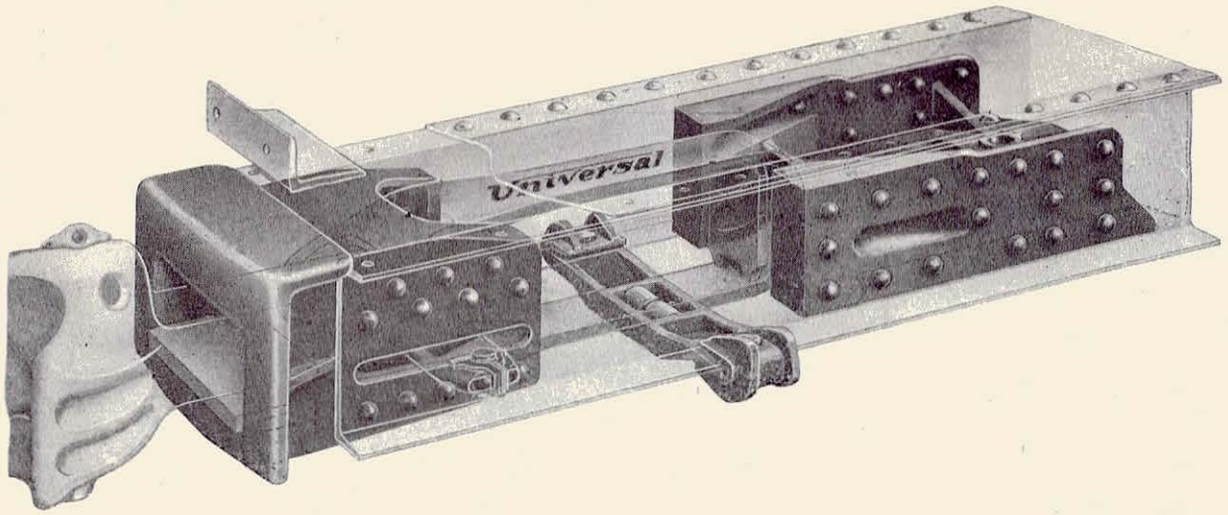
Facts on the performance of Armco Corrugated Iron Pipe for stream enclosure and other types of service are yours for the asking. Write today for catalog R-8.

Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill Company and always bear its brand.

ARMCO CULVERT MANUFACTURERS ASSOCIATION
Middletown, Ohio

Universal

DRAFT ATTACHMENTS



The *Universal* Draft Attachments are interchangeable with ARA and made to suit any design of car or make of draft gear.

BUFFERS—If required will be made to suit centering device; integral with front lugs or separate. If regular form with carrier iron integral, the **wear plate** will be from "*Universal* Alloy Steel" having long wearing qualities.

BOLSTER CENTER FILLER—combined with rear lugs or separate.

YOKES—*Universal* rear end box section providing maximum strength.

DRAFT KEY RETAINERS—"U" type having greatest possible wear surface top and underside of key. (ARA type will be supplied if desired)

DRAFT GEAR CARRIER—*Universal* of roller type (illustrated above) held in position with regular brake pin; may be easily and quickly removed or replaced. No wear on yoke.

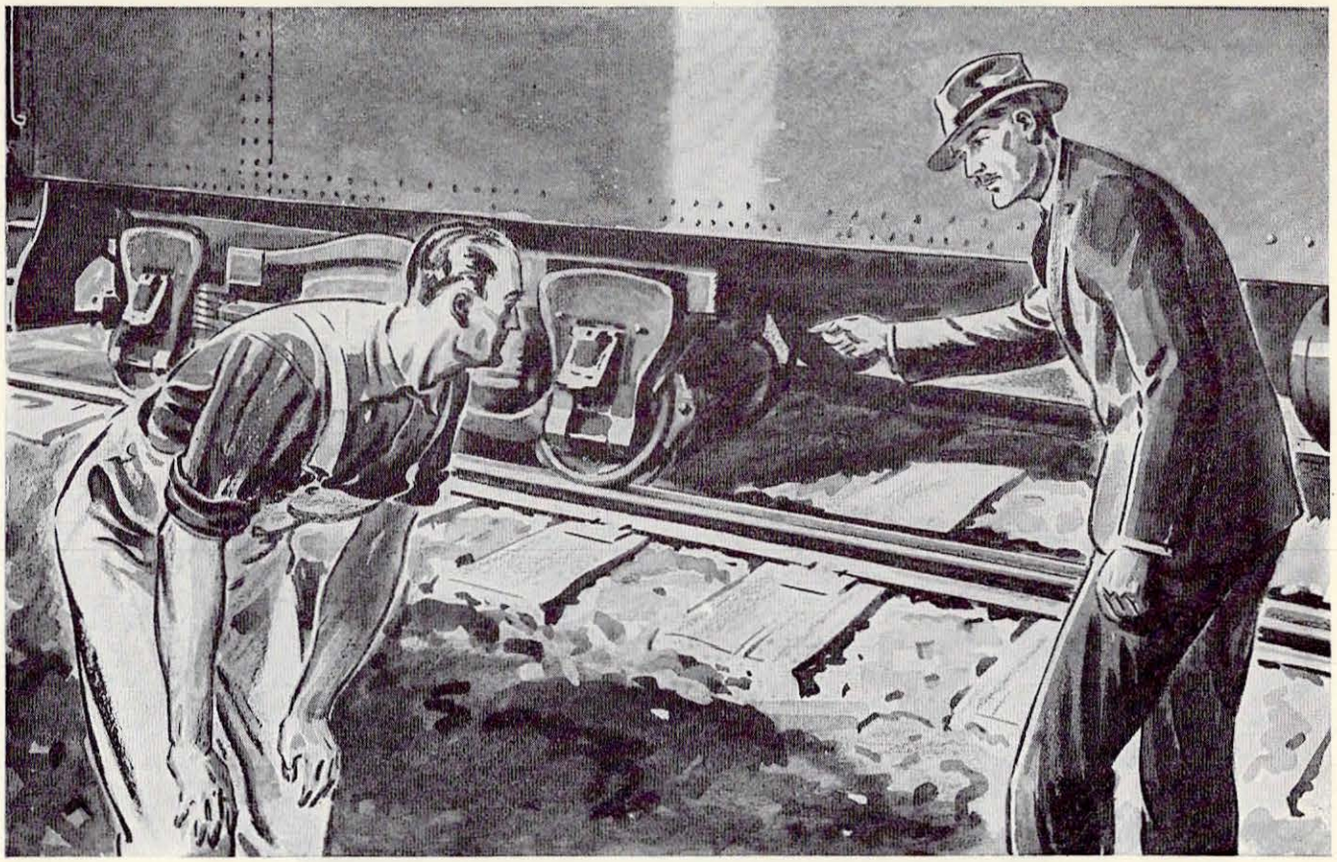
DRAFT LUGS—*Universal* XL extra long fold type at rear; thimbled through sill providing strongest possible construction at front.

Universal Draft Gear Attachment Co.

332 S. Michigan Avenue, Chicago

Royal Bank Building, Montreal, Canada

THEY WERE USING 1910 BOLTS ON 1931 MACHINERY



Design and materials had kept pace but obsolete, costly bolts were still used. An interesting R B & W case history

A PURCHASING AGENT for an R B & W customer asked us for prices on a type of bolt we had not made for his industry for years. We went to see what he intended to use the bolt for, and encountered a mechanical anachronism not without a vestige of humor.

A certain piece of equipment had been improved every few years, with the exception of the bolts, which remained the same type of 20 years ago, much too heavy for current requirements, and very expensive to make. The bolt had been designed in the days before cast iron flanges were replaced by the more ductile pressed steel flanges now in use, and when other parts of the equipment were cruder than now. But no one had thought to modernize the bolt design.

Of course the customer appreciated the suggestion of the R B & W Engineering Service that a standard bolt would serve the purpose and cost considerably less.

Has your bolt and nut design kept pace with other improvements? Does this offer an opportunity for constructive cost cutting and improved value of your products? Make the R B & W Engineering Service your Bolting Material Counsel.

R B & W EMPIRE BOLTS & NUTS

RUSSELL, BURDSALL & WARD BOLT & NUT CO.

ROCK FALLS, ILL. PORT CHESTER, N. Y. CORAOPOLIS, PA.

Sales Offices at Philadelphia, Detroit, Chicago, San Francisco, Los Angeles, Seattle, Portland, Ore.

THE MEMBERS OF THE - ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS operate on a definite foundry program, and meet the A.R.A. Specifications for Chilled Tread Wheels. *Chilled Tread Wheels Carry a Service Guarantee.*

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
1931
A R A
Cleveland Production Co.
New York Car Wheel Co.
New Orleans Car Wheel Co.
Reading Car Wheel Co.
Southern Wheel Co.
Louisville Car Whl. & Ry. Sup. Co.
Bass Fdry. & Mach. Co.
Central Car Wheel Co.
Pullman Car & Mfg. Corp.
Dominion Wheel & Fdries. Ltd.
Griffin Wheel Co.
American Car & Fdry. Co.
Canada Iron Fdries. Ltd.
Marshall Car Wheel & Fdry. Co.
Lobdell Car Wheel Co.
Maryland Car Wheel Co.
Canadian Car & Fdry. Ltd.
Albany Car Wheel Co.
Hannibal Car Wheel & Fdry. Co.
Mt. Vernon Car Mfg. Co.
Ramapo Fdry. & Wheel Works.
Tredegar Iron Works
Dickson Car Wheel Co.

THE MEMBERS OF THE - ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS operate 57 plants that are conveniently located to the various railway shop centers. These plants have a total daily capacity of 20,000 wheels.

TODAY'S standard of wheel economy and safety is the single plate Chilled Tread Wheel of TODAY.

Better Every Year

A slogan and a fact based upon definite laboratory and foundry programs.

FOR THE 70-TON CAR THE 850-LB. CHILLED TREAD WHEEL—THE HEAVIER THE CAR CAPACITY THE GREATER THE FACTOR OF SAFETY.

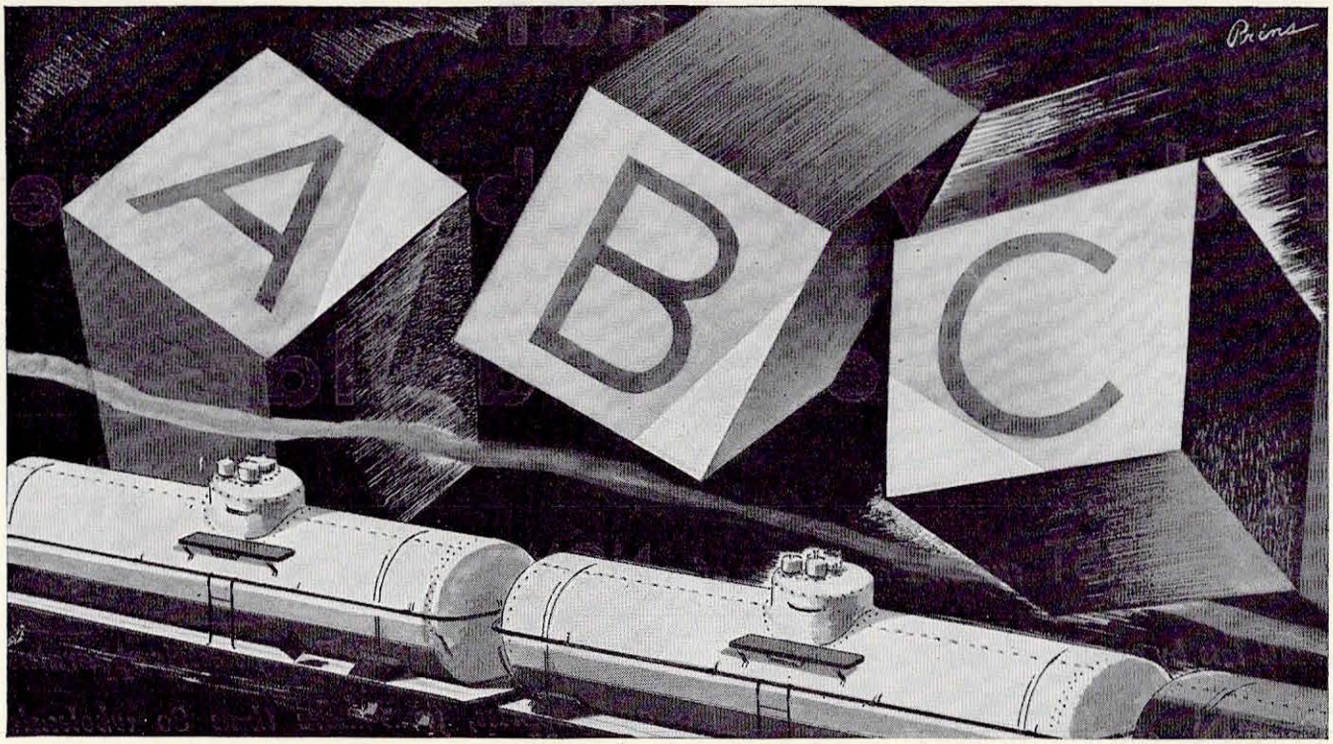
CHILLED TREAD WHEELS

A. R. A. Standards

650-lb. for 30-ton Cars—700-lb. for 40-ton Cars—750-lb. for 50-ton Cars—850-lb. for 70-ton Cars

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
1847 McCORMICK BUILDING, CHICAGO, ILLINOIS

THE A-B-C'S OF TANK CAR USES



MORE THAN *seven hundred and fifty* different commodities are being transported in bulk by tank cars alone. Below is a partial list... just the a-b-c's of tank car uses. Surely this list is conclusive evidence that "no matter what you are shipping General American can build a railroad freight car to carry it in bulk."

IN ADDITION to tank cars, General American builds every type of railroad freight car. It also leases to shippers a vast fleet of 50,000 cars (refrigerator, milk, express refrigerator, stock and tank), operates a large public terminal and an extensive European transportation system. *Address Continental Illinois Bank Bldg., Chicago.*

A
ACETALDEHYDE
ACETALDOL
ACETIC ACID
ACETONE
ACETONE OILS
ACIDS
ADEPS LANAE
ALCOHOLS
ALDEHYDE
ALDOL
ALKALIS
AMANINE RESIN
AMMONIACAL LIQUOR
AMMONIUM HYDRATE
AMMONIUM HYDROXIDE
AMYL ACETATE
AMYL ACETATE ETHER
AMYL ALCOHOL
AMYL HYDRATE
AMYLENE DICHLORIDE
ANHYDROUS AMMONIA
ANILINE
ANILINE OIL
ANIMAL OILS
AQUA AMMONIA
AQUA AMMONIUM
ARACHIC OIL
ARSENIC SOLUTIONS
ASPHALT
AUSTRIAN TURPENTINE OIL

B
BANANA OIL
BATTERY ACID
BEAN OIL
BEER
BENNE OIL
BENZALDEHYDE
BENZENE
BENZENE SULFONIC ACIDS
BENZINE
BENZOIC ACID
BENZOIC ALDEHYDE
BENZOIL HYDRIDE
BENZOL
BLACK FISH OIL
BLACK STRAP MOLASSES
BLAST FURNACE TAR PITCH
BLEACHES
BLEACHING COMPOUNDS
BLUBBER OIL
BODY OIL
BOILED OIL
BROMOBENZENE
BROMOBENZOL
BROWN COAL TAR PITCH
BROWN VINEGAR
BUBULUM OIL
BUTANE
BUTANOL
BUTYL ACETATE
BUTYL ALCOHOL
BUTYL CELLOSOLVE
BUTYRIC ACID

C
CASTOR OIL
CAUSTIC POTASH
CAUSTIC SODA
CALCIUM ARSENATE
CALCIUM CHLORIDE
CALCIUM CHLORIDE BRINE
CALCIUM HYPOCHLORITES
CARBON BICHLORIDE
CARBON BISULFIDE
CARBON DICHLORIDE
CARBON TETRACHLORIDE
CASEIN RESINS
CASINGHEAD GASOLINE
CEDAR WOOD OIL
CELLOSOLVE
CELLOSOLVE ACETATE
CELLULOSE ACETATE
CETYLACETIC ACID
CEYLON OIL
CHINA WOOD OIL
CHINESE BEAN OIL
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COACH VARNISH
COAL DISTILLATES
COAL NAPTHA
COAL TAR NAPHTHA
COAL TAR PITCH
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COCONUT OIL
COD LIVER OIL
CODOIL
COLOPHONY
COLZA OIL
COMMERCIAL RESINS
COPAL VARNISH
COPPERAH OIL
COPRA OIL
CORN OIL
CORN SUGAR
CORN SYRUP
COTTONSEED OIL
CREOSOTE
CREOSOTE OIL
CRESYLIC ACID
CRUDE CRESOL

GENERAL AMERICAN TANK CAR CORP.

"A RAILROAD FREIGHT CAR FOR EVERY NEED"

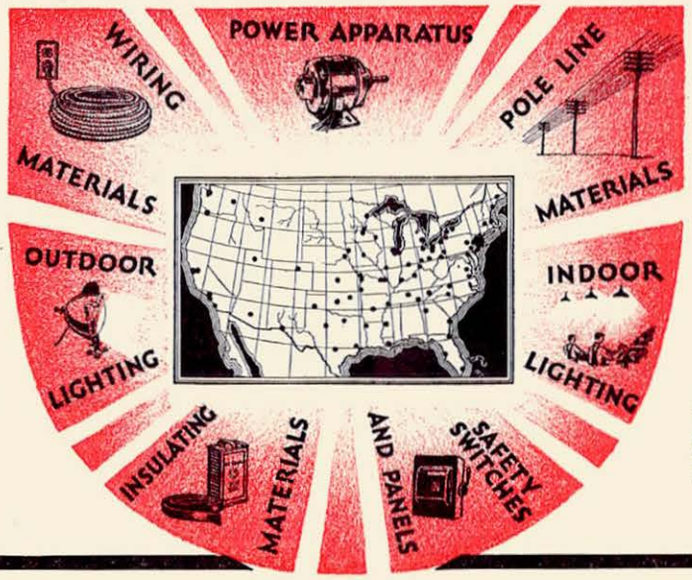
THIS IS ONE OF OUR NATIONAL MAGAZINE ADVERTISEMENTS TELLING PEOPLE THAT A RAILROAD FREIGHT CAR CAN BE BUILT FOR "EVERY NEED."

...that industry may buy more value per dollar

FIRST *custom manufacture of small lots by crude methods.*

THEN, *efficient production but with distribution methods yet to be perfected.*

NOW *economical distribution of a complete line of electric apparatus and supplies, from more than 80 wholesale warehouses, strategically located throughout the United States . . . All to the end that Industry may buy more value per dollar.*



You can obtain prompt delivery of *everything electrical* from a General Electric Supply Corporation wholesale warehouse near you.

GENERAL ELECTRIC SUPPLY CORPORATION

After a whole mile, just a few feet between the winner and the "also ran." Hardly a second between first and last, yet the extra degree of efficiency enables the winner to "manufacture speed" just a little faster than the others.

Efficiency ~and MORE Efficiency

Following the present period, the railroads will find themselves established on new levels of efficiency never before equalled. Reduction of costs is the order of the day.

Efficiency—and MORE Efficiency!

Yet efficiency is an individual accomplishment —a responsibility that touches and tests every member of an organization.

The Dearborn Chemical Company through its great laboratories and experienced representatives, offers a group of services—proven aids to efficiency. Principal among these is Dearborn Scientific Water Correction, favored by railroads the world over and outstanding in accomplishment because:

(1) Dearborn Treatment *prevents* scale-formation, foaming, pitting and corrosion in locomotive boilers.

(2) The cost of eliminating these troubles is the lowest for complete correction ever established. No expensive equipment is needed.

(3) Dearborn methods are dependable for results and this company is responsible with a record of constantly increasing service for nearly a half century.

If it happens that you are not sufficiently informed regarding this Dearborn Service to be using it, investigate — for the sake of that increased degree of efficiency and economy that it makes possible.

Add the power of scientific precision to your present attainments in correcting water troubles.

DEARBORN CHEMICAL COMPANY

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TRADE MARK REGISTERED

SYPHONS

Increase Boiler Efficiency

8.47%

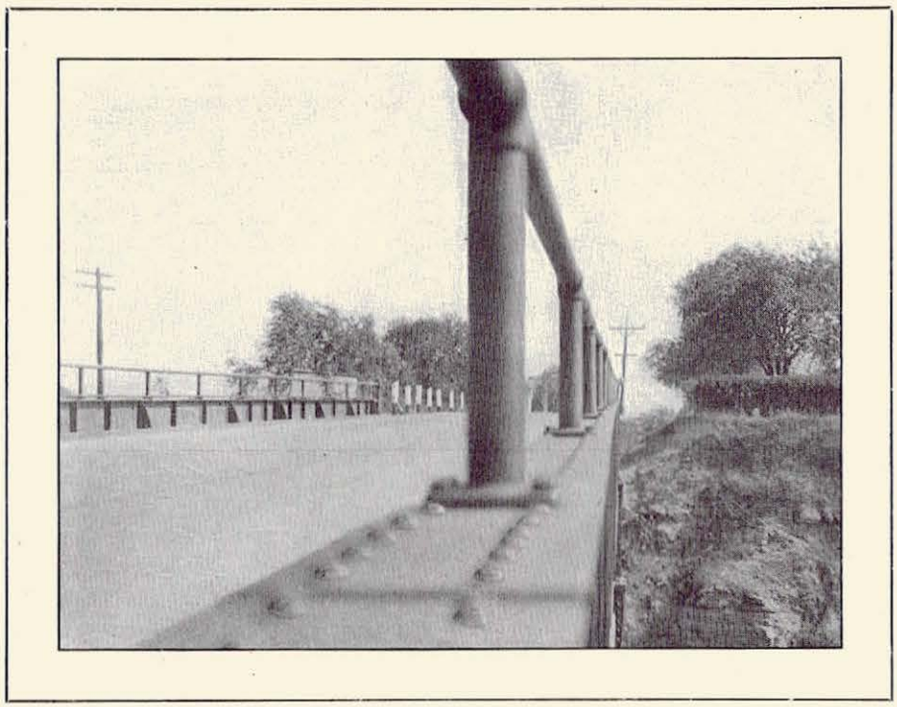
• Interesting records for comparison and analysis which proved that Syphons increase boiler efficiency 8.47% were produced in the University of Illinois tests of a locomotive with and without Syphons.

Here are shown (left) recording temperatures in the smoke box and (right) measuring draft in the ash pan. Four rates of evaporation were employed. Study of the University's Bulletin 220 has been helpful to many engineers.

CIRCULATION ◆ SAFETY
ECONOMY

LOCOMOTIVE FIREBOX COMPANY
NEW YORK CHICAGO MONTREAL

THIS STARTLING COMPARISON
Changed Railway Bridge Railing Specifications



THE service histories of the railings on two well known bridges in the State of New York, a short distance apart, recently caused a decided change in railway bridge specifications.

Here are the facts: In 1908 one bridge was erected with genuine wrought iron pipe railings. After 23 years exposure to severe corrosive conditions, the wrought iron railings are in excellent condition. The companion bridge, subjected to the same corrosive influences, was equipped with pipe railings—not of wrought iron. These railings have been replaced at a labor cost several times the cost of the pipe.

Pipe	Bar Iron
Tubing	Blooms
Casing	Nipples
Plates	Couplings
Sheets	*Weldells
Special Bending Pipe	

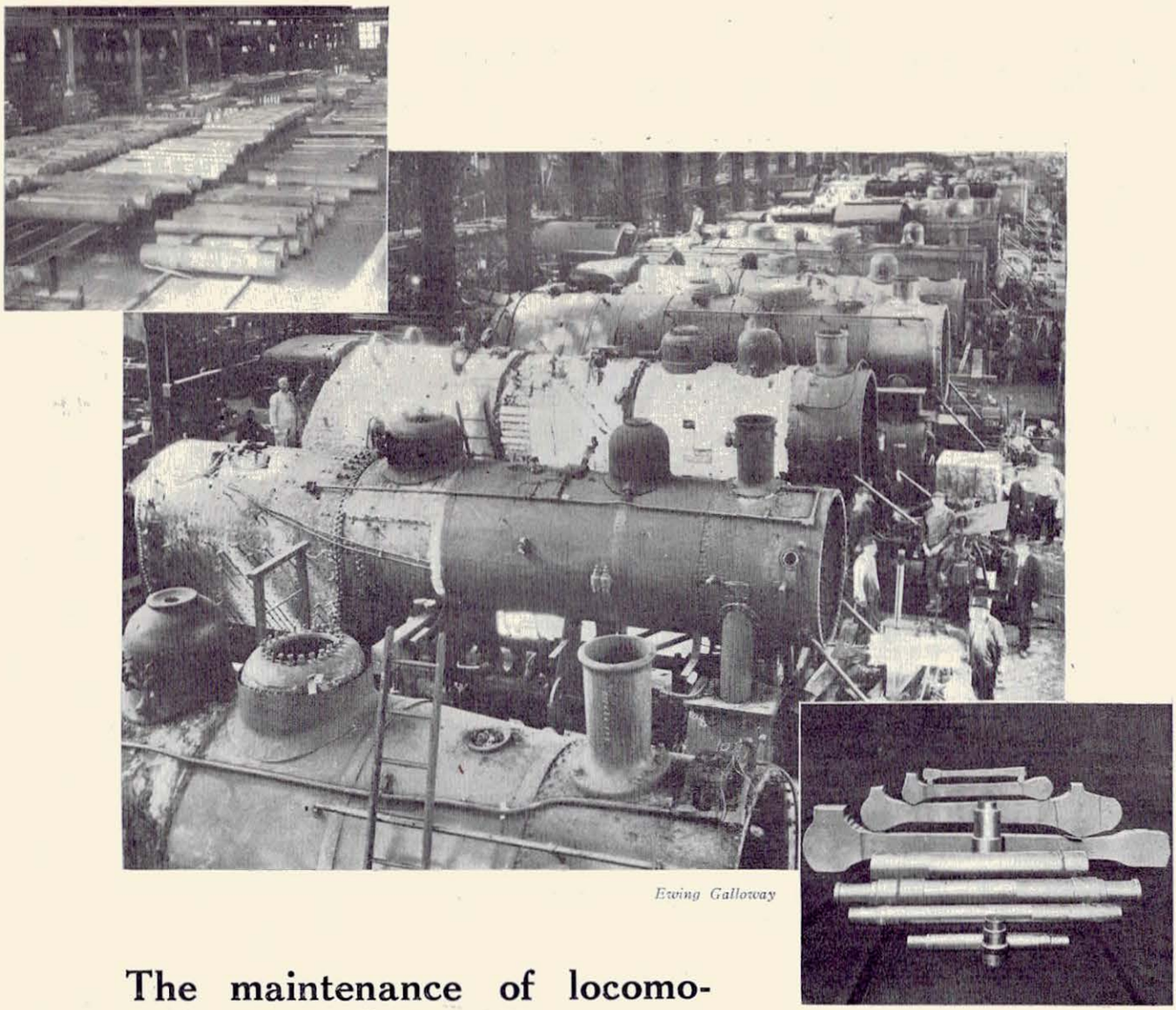
*Made by Locomotive Terminal Improvement Co. of Chicago.

This startling comparison has caused several railroads in the last 90 days, to change their bridge railing specifications. They now call for wrought iron—because nothing else can guarantee so definitely the *old-age factor of safety* which bridge railings must provide.

Byers Genuine Wrought Iron has been a railway standby for 67 years. Bridge railings represent one more example of its ability to serve you. Our modern methods of manufacturing permit a close control of chemical and physical properties which results in the finest wrought iron pipe ever produced. A. M. Byers Company, Pittsburgh, Pa. Established 1864.

BYERS GENUINE WROUGHT-IRON PRODUCTS

AN INVESTMENT — NOT AN OUTLAY



Ewing Galloway

The maintenance of locomotives and the frequency of repairs and replacements depends upon the parts used. "Standard" parts are dependable. They combine long life with safety and economy.

Tires
Rolled
Wheels
Steel Tired
Wheels
Forgings
Steel
Castings
Billets

STANDARD STEEL WORKS COMPANY

GENERAL OFFICE & WORKS: BURNHAM, PENNA.

CHICAGO
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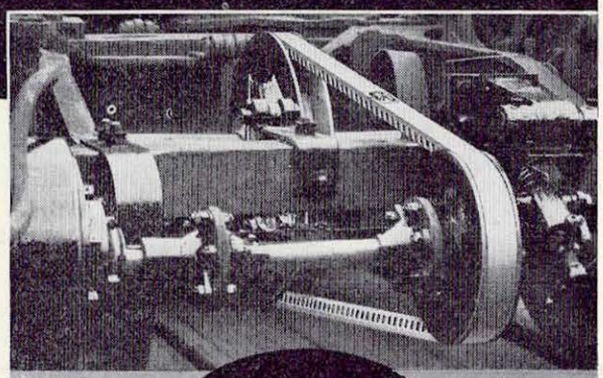
MODERNIZE!...

HERE'S THE DRIVE THAT PERMITS YOU TO AIR-CONDITION YOUR CARS EASILY...

at low cost for power



Install Dayton-Roderwald Drives for the generators which supply the power for your air-conditioning plant. These famous drives are economical, trouble-free and positive. They give you a dependable source of power, without which there can be no efficiency or satisfaction in air conditioning.

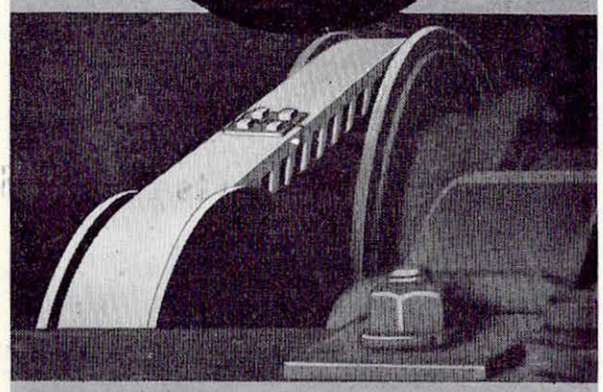
The Dayton-Roderwald Drive is far less costly to install and far less expensive and troublesome to operate than other drives. It gives you positive driving with an efficiency by actual test of between 98 and 99 per cent. And this efficiency is obtained with much less friction waste, much less loss of power and much less wear on equipment than is the case with other drives.

For these drives use the famous Dayton-Roderwald Cog V-Belts which grip the pulley grooves firmly, without slippage and without tension. That's why they neither overheat nor wear out your bearings.

Notice the patented fastener for joining the ends of a Dayton-Roderwald V-Belt. This specially constructed hinge-pin fastener will outlast the life of the belt itself.

TROUBLE-FREE IN WINTER

These modern drives eliminate trouble in scores of ways. For instance, snow and ice can't clog them. They are efficient at all speeds and in all weathers. They keep batteries always full-charged by providing greater generator output, giving brilliant, non-flickering lights and constant air-conditioning service at low cost.



QUICK INSTALLATIONS AND REPLACEMENTS

The Dayton-Roderwald is the only canvas rubber V-Belt that takes a fastener successfully. This means quick installations and speedy replacements for no special tools are needed. It is not necessary to tear down any axles or generator assemblies.

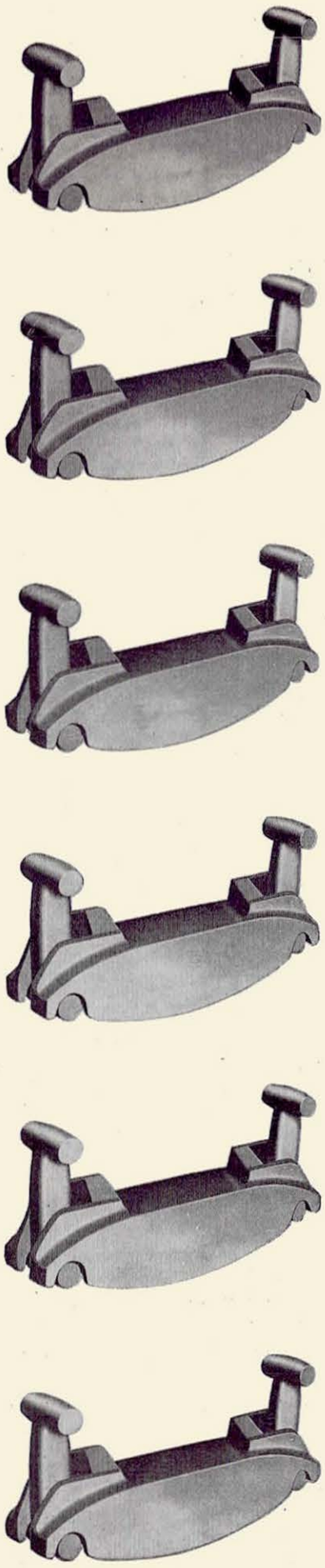
Find out for yourself *all* the strong points of Dayton-Roderwald Drives. One of our engineers will, on request, supervise a FREE TRIAL installation on your cars. Write for a detailed description of the Drive by our engineering staff.

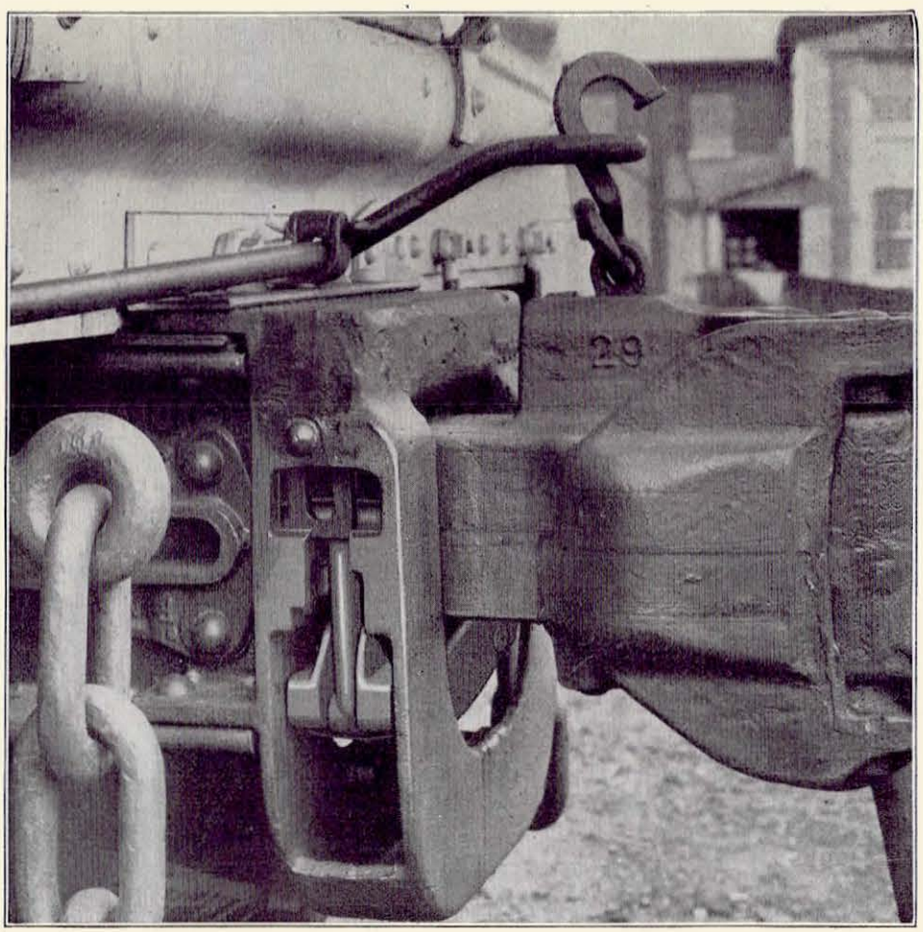
THE DAYTON RODERWALD COMPANY

SUBSIDIARY OF THE DAYTON RUBBER MFG. CO.,
WORLD'S LARGEST MANUFACTURER OF V-BELTS
DAYTON, OHIO

Dayton-Roderwald

Axle-Lighting-Drive



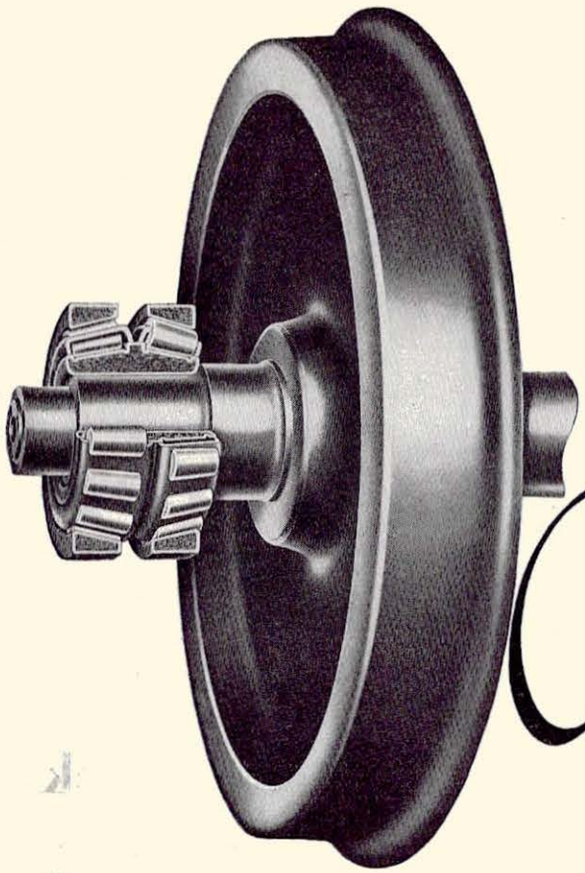


Safety First

The gravity carry iron of the Union Centering Device returns the coupler to its normal central position. This provides a safety feature well worthy of consideration.

UNION METAL PRODUCTS COMPANY

NEW YORK · CHICAGO · ST. LOUIS · WASHINGTON
RICHMOND · HOUSTON · SAN FRANCISCO · KANSAS CITY · MONTREAL

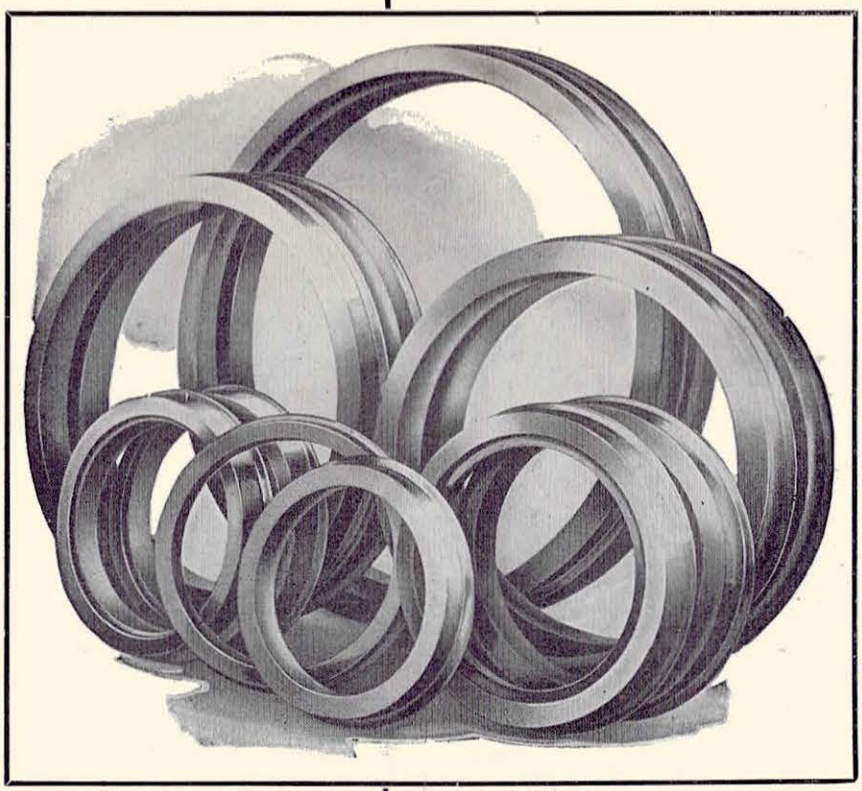


You can have these proved advantages by adopting Timkens

It has been demonstrated beyond the faintest shadow of a doubt that Timken Tapered Roller Bearings eliminate friction, abolish hot boxes, reduce starting resistance 88%, cut bearing replacements to practically nothing, make possible faster schedules and longer non-stop runs and provide greater riding comfort for passengers. They pay for themselves with the savings they effect. You can have all of these *proved* advantages by adopting Timken Roller Bearings.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**



Tires
Wheels
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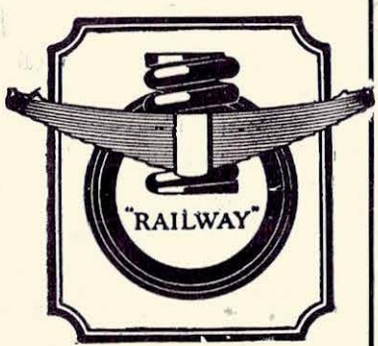
For Every Type of Rolling Stock In Every Class of Service

"RAILWAY" locomotive and car wheel tires are made to meet the particular requirement of service. It may be the long continued run of the passenger train or the many stops and starts of the switcher with its constant crowding through switches. For every type of use a tire must be employed that will give the maximum life if there is to be the greatest economy.

Only experience and laboratory research can provide that knowledge. You find it in all "Railway" products.



Railway Steel-Spring Company

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Branch Offices:

Chicago, Ill. Detroit, Mich. St. Louis, Mo. Pittsburgh, Pa. Montreal, Que.
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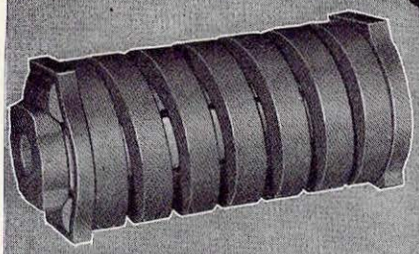
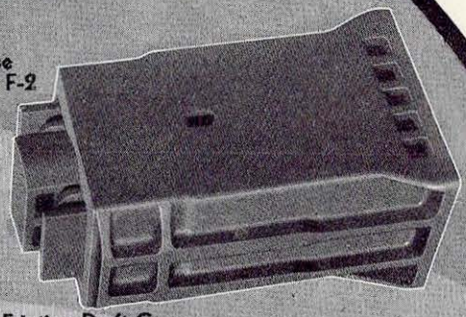
Cardwell and Westinghouse Draft Gears are made in sizes, capacities and designs to fit any new or old car, or locomotive.

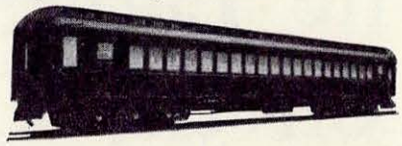


Cardwell Westinghouse Friction Draft Gear Type F-2

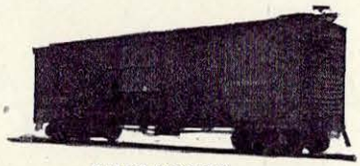


Westinghouse NY-11-D Friction Draft Gear

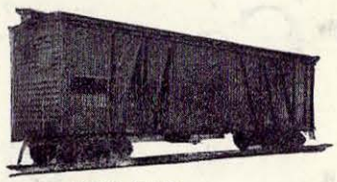
Cardwell L-25 Friction Draft Gear



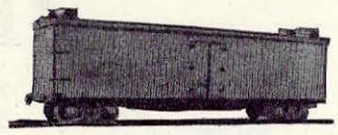
PASSENGER



AUTOMOBILE



BOX CAR



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Sustained Protection Reduces car maintenance costs

Let us explain the new developments which enable Cardwell and Westinghouse Draft Gears to retain their initial high capacity throughout their long life. » »

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CARDWELL AND WESTINGHOUSE DRAFT GEARS Fulfill All A.R.A Requirements

The Largest Railroad on the Continent

CANADIAN NATIONAL

Cost of Roof Maintenance on 30,000 Cars Equipped with

DRY LADING ROOFS

18 Years 1913 to 1930 Inclusive-

$4,519.49

Average Per Year for entire 30,000 roofs—$250.00	Average for 18 Year Period per roof—15 cents

Average Per Year per roof—less than one cent

Proves Itself the Greatest Economical Improvement in Car Construction.

Hutchins Car Roofing Company

RAILWAY AGE

Pollyanna and Santa Claus in Business

Daniel Willard, president of the Baltimore & Ohio, was quoted a few days ago as having said that business would get better when people quit looking for Santa Claus. There is more economic wisdom packed in that remark than in any other we have heard or read regarding the way to get out of the depression.

In September, 1929, the Dow-Jones average of railroad stock prices reached a maximum of $189.77 and the average of industrial stock prices a maximum of $381.17. On October 5, 1931, the railroad stock average was $45.68 and the industrial stock average $86.48. In other words, these averages, in September, 1929, were about four and one-half times as high as they are now.

The nation has been standing with bated breath and pallid countenance watching the recent decline of prices in the stock market and thinking and talking about it as if it foretold the utter disintegration of our economic system and the crack of doom.

But recall what was occurring in September, 1929. Stock market prices were then advancing to the highest levels ever known, and the nation was then watching their advance with the wildest optimism, believing it indicated that prosperity was going to continue forever and rapidly become greater until every man who owned a hundred shares of New Economics Preferred or Buncombe Common could soon go and sit under a tree and bask the rest of his life in the sunshine of affluence and the aroma of luxury.

What the Stock Market Really Shows

And what did the advance of stock market prices in 1929 really show? Only that at least nine-tenths of those who buy and sell listed stocks know nothing about economics, and that their optimism was entirely the optimism of mob ignorance and lunacy. Within a few weeks after prices reached the highest level ever known, there occurred a collapse in which, within a few days, the advances of years were wiped out. The greatest advance in stock market prices ever known was also followed by the beginning of the longest and most profound depression ever known. That is how the stock market forecasted business in 1929.

Will Depression Last Forever?

What, then, is the significance of the recent decline in stock market prices? Does it indicate that these prices are going to continue to decline forever and that the depression is going to last forever and constantly get worse? On the contrary it shows just what the great bull market did in 1929. It shows that nine-tenths of those who buy and sell stocks still know nothing about economics, and throws not a ray of light upon the fundamental conditions and vital influences which are determining what general business will be a year from now or even a month from now. The changes in stock market prices during the last three years have forecasted coming business conditions just about as accurately as the results of a negro crap game.

Business is rotten. It was beginning to get rotten two years ago without the stock market having the slightest inkling of it, has grown rottener ever since, and now is the rottenest in history. Why has it constantly grown worse? First, because of selfish and stupid policies that were adopted by government and business throughout the world, and especially in this country, during the years of prosperity, and, second, because for two years most people, and especially most public men and business men, have been relying upon Pollyanna and Santa Claus.

Our Late Leader, Pollyanna

Pollyanna was the necromancer who was immediately to stop the decline of business. We had had a "new economics" during the years of prosperity, and we still had it after the stock market collapsed. All we needed were confidence and optimism. No work or brains were required. None of the government and business policies that had ended previous depressions were needed. Everything was all right if we would just think so and avoid doing anything about things

that were all wrong. Governments, business concerns and individuals must spend more out of reduced incomes in order to maintain incomes. Wages must be maintained even if there were no earnings with which to pay them, because if they were not maintained, there would be no earnings. Expenditures upon public works must be increased because, although taxes had been increased three billion dollars a year within the preceding six years, there was only one way to make a nation rich and that was to tax it rich, and the fact that business and employment were declining in spite of previous huge increases in taxation demonstrated that the way to maintain business and increase employment was to increase taxation.

Strangely enough, business did not revive as a result of being dosed with these policies. It gradually sank into a stupor and finally into a coma. General optimism, for which there was no economic justification, has been followed by general pessimism, for which future developments will show there is equally little economic justification.

And Now—Santa Claus

Pollyanna and the new economics having failed to revive business, we have now called in Santa Claus. The Russian soviets have a plan, and so we must have a plan. We must plan years ahead, and meantime not reduce government expenditures, but increase the taxes with which to pay them. Persons who have money which they might themselves spend in reviving business must have it taken from them and spent upon some gigantic scheme of public works, as if employment can be increased only by transferring from private business to government the power to give it. All our transportation, industrial, commercial and financial activities must be brought under the survey and supervision of some central body composed of public men and business men selected because they signally failed to do anything to prevent the inflation of 1928 and 1929 and have signally failed to do anything effective to abbreviate and alleviate the depression.

The nation needs a plan. But it does not need any new plan. It needs to fire Santa Claus, as it has fired Pollyanna. It needs to force the local, state and national governments drastically to reduce their expenditures and quit proceeding upon the assumption that a nation can be taxed rich. It needs to kick government out of every business in which it has interfered in the past and is interfering now, because all government can do is to prevent business men from managing business and use its power to help some at the expense of others with the certain result of injuring all.

Incentive to End Unemployment

After having given government a swift kick, the people should settle down to doing their own work and running their own business the best they can. Railway rates should be advanced because the business men who have to run the railways agree an advance in rates is required to enable the railways to pull through the present emergency, and they are the best judges of that. Prices should be stabilized and increased by cooperation between the leaders of the various industries and without government interference. All the retrenchments required to convert business concerns from a deficit to a profit basis should be made, and if, to this end, wages must be reduced, then wages should be reduced. There will be no revival of employment until it will pay business to increase employment. Individuals should spend what they can reasonably afford to, but practice the thrift necessary to keep their outgo within their income.

The theory of the new economics is that of more leisure and less thrift—that is, that the more we loaf and spend, and especially the more government spends, the richer we will be. It does not work. It did not work during prosperity, as the destruction of our prosperity shows, and it has not worked during the depression, as the prolongation and deepening of the depression have shown.

How About Business?

And how about business? It is still as rotten as we have already said. Is it going to stay rotten? Of course not. Nine-tenths of the people are usually wrong about business. That is why they stay poor. They think when it has been good a long time that it is going to stay good, although experience shows that is the surest sign that it is going to get bad. They think when it has been bad for some time that it is going to stay bad, when all experience shows that is the surest sign that it is soon going to get good. The stock market says that nine-tenths of the people now think that business is going to stay bad forever. That is the best possible reason for optimism.

Depression was produced by wild speculation and unsound government and business policies, all helping to cause inflation. The collapse of the stock market and the decline of commodity prices have made necessary numerous important readjustments. Many of these have been made. All others needed are being made.

What is necessary to complete them? Simply to work and think and fight—for every man who has a job to do the best and most work he can, for every manufacturer to exert his brains to the utmost to provide industry with tools that will effect economies, or styles that will attract public favor, for every business concern to increase sales efforts and for everybody to quit looking for Santa Claus and fight to put government in its proper place.

We need a plan of making the government attend to its own business and of the people attending to theirs. By following that plan the American people became the freest and most prosperous in the world. The solution of their present vital problems is to be found by trying that same old plan again.

Should Accounts Reflect Actual Facts?

Depreciation accounting such as is prescribed in the Interstate Commerce Commission's recent order, written by Commissioner Eastman, would remove a large part of the little remaining flexibility left in railway accounts.

The necessity for such flexibility ought to be apparent to anyone who has followed the course of railway earnings during the current year. Charges to depreciation on a straight line basis in such a time would turn many a modest showing of net railway operating income into an operating deficit, with obvious results to railway credit.

The inclusion of the telephone companies with the railroads in this proceeding was most ingenious. The telephone companies approve of the practice of straight line depreciation accounting. There is no reason why they should oppose it. Straight line depreciation accounting results in relatively greater charges to operating expenses in the earlier years of a company's existence and during periods of rapid expansion than would replacement accounting. The telephone companies are both relatively new and have enjoyed a rapid expansion. Heavier operating expenses cause no great concern to them because they are actual monopolies and the courts have upheld them in their right to earnings approximating 8 per cent on their investment. They have no difficulty in collecting an adequate depreciation reserve from their patrons and it is, for them, a wise business policy to build up such reserves while the going is good.

But can the railroads whose earnings fluctuate over a much wider range than those of the telephone companies safely follow a similar practice? If the Interstate Commerce Commission would kindly arrange for the railroads to earn, on the average, 8 per cent on their investment, then perhaps they too might look with favor on this method of accounting. Even then, however, there would be far less reason for establishing such accounting practice for all classes of railroad property than there is in the case of the telephone companies.

Railroads are made up of a multitude of units, varying greatly in service life. Any set percentages of annual depreciation, therefore, are bound to be the crudest of arbitrary estimates, probably in no one single case accurately reflecting actuality. And yet accounts are taken by the courts, by financiers, by regulatory authorities and by the public at their face value—as an accurate reflection of facts.

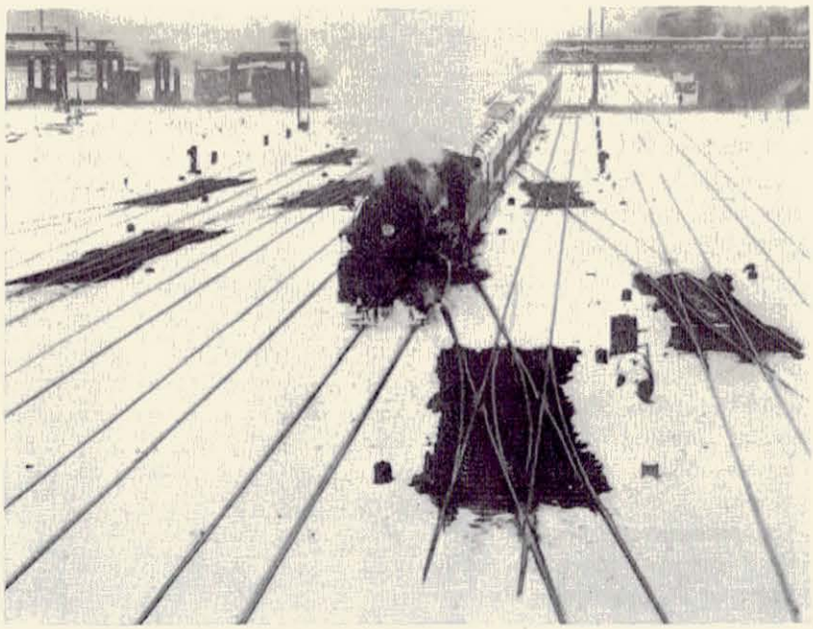
The courts have repeatedly declared that public utilities are entitled to revenues large enough to maintain their properties—not merely to protect the original investment in these properties. In an accounting sense, however, the right of the railroads to follow this course has been denied. This means that when any unit is replaced by an identical new unit at a higher price level, it is only the original cost of the retired unit which can be charged to operating expenses. The difference between the cost of the new unit and the one retired must be charged to capital account. Thus the capital account increases without any increase in plant capacity. This is a negation, in accounting, of legal rights as defined by the courts. Should accounts, or should they not, be made to reflect accurately the facts? And does either the present practice of charging only the original cost of most retirements to operating expenses, or Commissioner Eastman's depreciation plan provide that the accounts should accurately reflect the facts? There can be no conclusive answer to these questions until the courts are called upon for their opinion.

Railroad Enterprise

Beset though they are by regulatory restraint and red tape, the railroads are still capable of exhibiting spirit and enterprise. For example, we have recently seen some of them provide a type of freight service which, rivaling passenger service in speed, is unique in transportation history. In the east, the Boston & Maine, the New York, New Haven & Hartford, and the Pennsylvania are joining to provide over-night service for freight between Portland, Me., and New York, and between Boston, Mass., and Baltimore, Md. Quite recently the St. Louis Southwestern has established a freight train which gives over-night service from St. Louis, Mo., to Pine Bluff, Ark., Camden, and Shreveport, La. This train, leaving St. Louis in the evening reaches Pine Bluff, 400 miles, early in the morning, and arrives at Shreveport, 590 miles, before noon. In the case of the Cotton Belt, as of the eastern lines, motor trucks are used to augment and expand the effective radius of the train service.

Speed and cost, with the emphasis on the former, are the principal factors in a shipper's determination as to which agency of transportation he will patronize. Motor trucks, largely unregulated and operating on a roadbed provided at public expense, have a substantial advantage over railway trains from the standpoint of cost of service. With respect to speed, the more important factor, however, the railways are capable of running circles around competing motor trucks. The "Maine Bullet" and the "Speed Witch," operated by the Boston & Maine, the New Haven and the Pennsylvania, and the "Blue Streak" operated by the Cotton Belt, together with the many other fast freight trains now being operated by the railways between points where truck competition has gained or is gaining a strong foothold, are utilizing the railways' most important advantage in the present fight to hold and gain traffic.

Operating Economy Series



Snow Melters Save Money

Article No. 14

Fighting Snow — Killing Weeds

Expenditures for labor can be greatly decreased by providing equipment for fighting snow storms and by employing mechanical and chemical means for eradicating weeds

IT is possible to realize a saving equal to as much as 20 per cent of the investment in an installation of snow-melting appliances during the course of a single storm. This figure includes only the reduction in out-of-pocket expenditures incurred in keeping switches and other trackwork in operation, and makes no allowance for the equally large or even larger indirect savings that accrue from the elimination of traffic interruptions and of train delays by reason of the greater effectiveness of adequate installations of snow melting devices. With such equipment it has been demonstrated as recently as last winter that it is possible to keep trains moving under storm conditions so severe as positively to tie up traffic in terminals not so equipped, regardless of the number of men employed with shovels and brooms.

These statements are capable of verification by anyone who will review the experience of the railways in the Chicago terminals during the blizzards of the last two winters.

A storm in December, 1929, afforded a remarkable opportunity for a comparison of the relative effectiveness of snow melting equipment and more primitive methods, for at that time only the tracks at the Union station were protected to any extent with modern appliances and it was only the railways using this station that escaped serious interruptions of service and serious train delays. With this object lesson fresh in mind extensive installations of snow melters were provided in a number of the Chicago passenger terminals during 1930, so that when the winter of 1930-31 brought two storms in which the snowfall, 19.1 in. and 16.2 in., respectively, exceeded the record of 40 years, it was possible to develop direct comparisons of the cost of fighting blizzards with and without modern facilities.

Many Appliances Now Available

Another interesting outcome of recent experiences with winter storms, is the marked development that has taken place in snow melting equipment, as a result of which a wide variety of devices is now available for use around switches, interlockings, car retarders, etc. These may be classed as fixed, semi-portable and portable. Under the first heading come electric, gas, steam and oil heaters, comprising groups of heating units installed between the ties under switches, frogs, etc., whereby the rails are heated uniformly to a temperature well above the freezing point. These are normally installed in the fall so as to be in readiness for immediate use at any time during the winter. The second class is represented by oil-burning pots that are used in the same way as the fixed melters, except that they are not set in place until the storm approaches and must be refueled at stated intervals. The third class embraces hand torches equipped with portable fuel reservoirs or connected by hose lines to stationary oil tanks, car-mounted oil-burning heaters (weed burners in snow-melting service), and steam-jet snow blowers installed under the foot boards of switch engines.

Will Reduce Cost of Snow Fighting

Ample data are available to demonstrate the economies that can be realized by the use of each of these types of equipment. An installation of gas-burning units for the protection of 31 double slip switches and 19 turnout switches at the Chicago Union station, representing an expenditure of $30,000, was responsible for a sav-

ing of $2,000 in the storm of March 7, 1931, after taking account of the cost of 1,500,000 cu. ft. of gas consumed. Burners of the same type installed at four interlocking plants on the Chicago & North Western in sufficient numbers to equip 25 turnouts and derails, 9 double-slip switches, and 14 removable-point crossings at a cost of $17,000, saved $2,866 during the same storm. An investment of some $16,000 for oil-burning pots on the Illinois Central for the purpose of melting snow at 237 main-line turnouts, 4 single-slip switches, and 41 double-slip switches, produced a net saving of $7,032. During the same storm, three weed burners marshalled into service at the Markham yard of this road were able to keep all of the car retarders, as well as the switches on the ladder tracks leading from the two humps, clear of snow and thus permit uninterrupted operation of the yard, whereas other roads with car retarder installations in the same territory, that were not provided with snow-melting appliances were compelled to suspend operations. The fact that it was necessary to employ 80 men in one section of the yard, while one weed burner was out of service on account of a breakdown affords a measure of the savings effected.

The economies cited in the various instances represent only the savings in wages of casual labor that would otherwise have had to be employed, less the cost of fuel burned and other operating expenses involved in the use of the snow-melting devices. Based on a careful comparison of the number of men employed in the storm of March 7 with the forces required during storms of less severity during the previous winter, when only a limited amount of equipment was employed, it is estimated that these installations in service in Chicago reduced the labor demand by the equivalent of 4,680 men for one eight-hour shift.

Storm Experience in the East

During a storm that lasted eight hours in the Cedar Hill yard of the New York, New Haven & Hartford, 100 switches were kept clear by an equal number of oil-burning snow melters of the fixed type that represented an investment of about $7,000. The operating expense included the cost of 796 gal. of oil at 14 cents a gallon and the wages of a foreman and a plumber at 79 cents per hour and 7 trackmen at 40 cents. Based on experience with storms previous to the installation of this equipment, it was estimated that without the snow melters, from 100 to 150 men would have been employed during the storm in an effort to keep the yard in operation, and it is doubtful if all of the switches could then have been kept clear. At another terminal equipped with the same devices on 50 switches, only 3 men have been employed during blizzards, whereas 75 to 80 men were formerly required. Still another road reports that 15 switches at the throat of a tunnel entrance are effectively protected by melters of the same make with the service of only one man and an oil consumption of about one gallon per hour per unit.

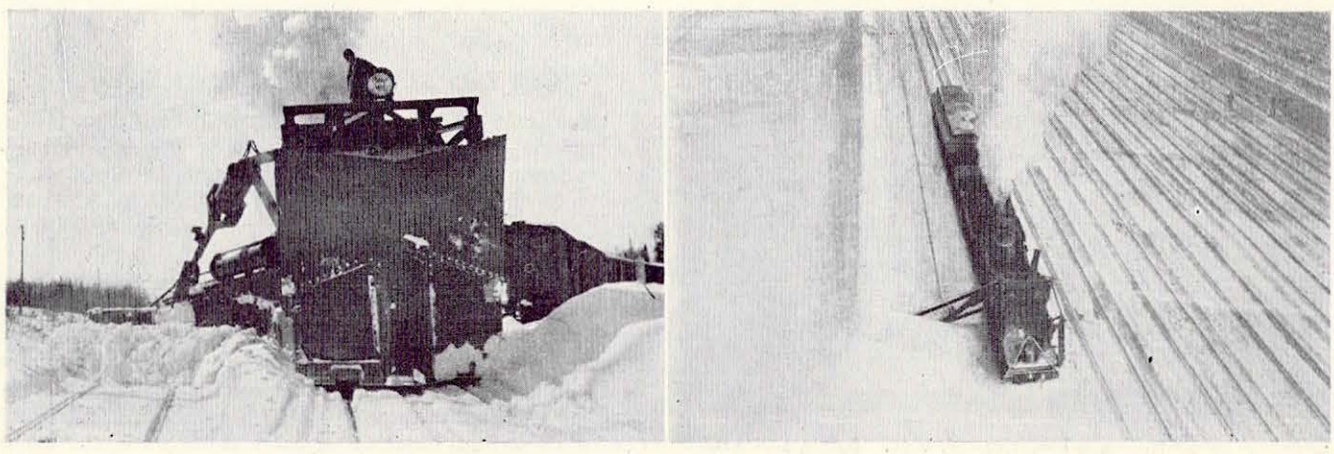
The above statements of saving include nothing to represent an evaluation of the elimination of train delays or interruption of service such as occurred at Chicago in December, 1929, when trains were delayed as much as seven hours, suburban schedules were virtually abandoned and conditions were so bad in some terminals that passengers had to be discharged from incoming trains six or seven miles from the downtown terminals.

Economies in Removing Snow

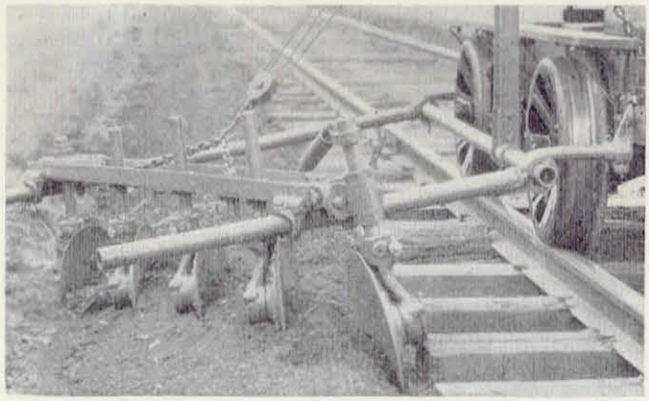
There are opportunities also for economies in the use of snow fighting equipment other than that employed to clear flangeways and to insure that switch points, movable crossings, and other track fixtures are free to move. For, in addition to this problem there is that of the removal of deposits of snow so deep as to constitute an obstruction to train movement but the use of adequate snow plow equipment is so well established as to come under the head of emergent necessities rather than measures designed to effect operating economies. On the other hand, the application of modern ballast spreader plows in such service, while by no means new, is not as general as the potential savings should warrant. Not only have these machines been used with a special snow-plow attachment to clear main lines, but the spreader wings have been employed to clear adjacent tracks or to widen snow cuts made by rotary plows. However, their most valuable service has been performed in yards. In such service it is the practice to plow the snow from 5 or 6 tracks on both sides on to one track that is taken out of service temporarily, repeating this operation on similar groups of tracks across the entire yard. The snow thus piled up is either loaded on cars or, if the track can be spared, is left to melt away. When equipped with manganese steel teeth, the plow of the spreader can be used effectively as an ice cutter.

Other Equipment Is Available

The removal of piled-up snow representing the accumulations resulting from the clearing of tracks, platforms, and roadways around stations and other terminal facilities can be carried out effectively with clamshell-equipped cranes, and at a large saving in cost com-



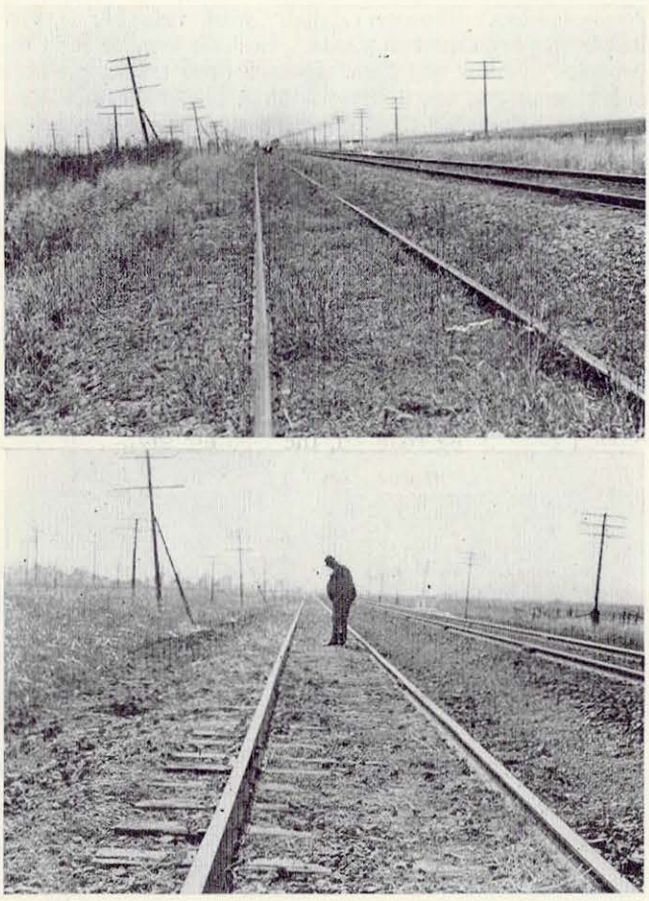
Ballast Spreaders Do Effective Work on Main Lines and Save Money in Clearing Yards



A Close Up View of a Motor-Car Propelled Discer

pared with hand labor. More recent developments as applied to off-track railway facilities include the use of motor trucks in the disposal of snow, the employment of crawler tread and industrial tractors for the operation of push plows and revolving snow brooms and the handling of equipment and men in motor trucks where tracks are blocked or congested. These developments are concerned primarily with the adaptation of equipment acquired for other uses and therefore call for initiative and resourcefulness rather than added capital outlays.

The use of machinery and snow-melting equipment in fighting blizzards and heavy snowfalls has been developed to a point that leaves no doubt as to the economies to be realized. Not only do these practices effect a direct saving in labor but by obviating the need for employing casual laborers, they eliminate most of the confusion and misdirected effort that necessarily attends the employment of untrained men. They also effect a marked reduction in the exposure to accident in a type of employment that is exceedingly hazardous.



Chemical Weed Killing is Effective—A View "Before and After"

Saving Money in Killing Weeds

Of all the opportunities for the elimination of manual effort in railway service, none holds out more positive assurance of economy than those offered in the killing of weeds and the mowing of the right of way. But entirely aside from the immediate savings to be realized, the consistent application of some of the methods of eradicating weeds effects a gradual reduction in the vigor of the growth whereby the cost of weed killing in subsequent years is greatly reduced, whereas manual removal results in no permanent improvement. As a matter of fact, the question raised today in connection with the killing of weeds is not alone that of securing the saving possible through the elimination of hand labor in such work, but also that of obtaining the benefit of effective weed eradication by the use of mechanical or chemical methods on those railway lines where only indifferent or perfunctory efforts are being made to remove weeds because of the prohibitive cost of hand work.

Yearly Record of Chemical Application

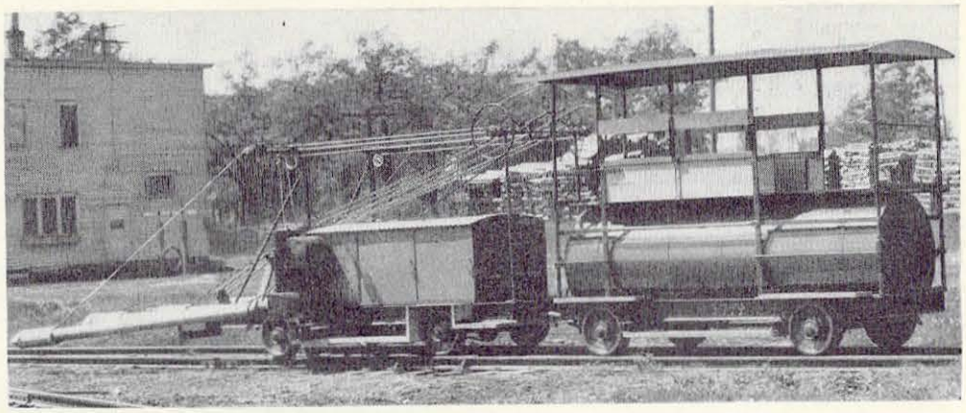
Railroad	Year	Total Single Track Miles Treated	Total Gallons	Average Gallons per Mile
A	1925	1086.5	76,296	70.2
	1926	1679.0	93,800	50.0
	1927	2178.0	117,787	54.0
	1928	3222.7	142,711	44.3
G	1925	331.0	20,000	60.0
	1926	1315.0	70,000	53.0
	1927	5056.0	259,000	51.0
	1928	5652.1	221,400	39.1
H	1925	900.0	59,950	66.5
	1926	2547.9	208,300	81.7
	1927	5063.0	395,500	78.1
	1928	5705.7	372,000	65.2

While the deteriorating influence of weeds on track is so intangible as to defy even approximate evaluation, the damage done is nevertheless a real one. Vegetation of any kind produces humus around the roots and this, together with the annual deposits of dying surface growths, fouls the ballast, decreasing its bearing power and reducing its effectiveness as a medium for drainage. Furthermore, the presence of weeds produces an unsightly condition of the track that is bound to interfere with efforts to instill enthusiasm and sincere interest on the part of the track forces. No foreman can be expected to take pride in his section if the track is almost concealed by a heavy growth of weeds. By the same token, hand weeding is a disheartening task and it is not surprising that the cost of removing weeds with shovels or hoes or pulling by hand runs high.

Cost Data on Weeding and Weed Killing

According to a report presented before the Roadmasters Association in 1929, the cost of weeding by hand varies from $30 to $90 per mile for one weeding, while, owing to the regrowth it costs from $90 to $250 per mile per season to keep track reasonably free from weeds.

Methods of weed removal designed to eliminate hand work will result in savings of $30 to $150 per mile of track per year. The most effective substitutes for hand weeding are burning and chemical treatment. The use of chemicals involves the sprinkling or spraying of the roadbed with solutions of sodium arsenite and, more recently, of sodium chlorate or calcium chlorate, the latter



These Machines Save Money Killing Weeds in Summer and Melting Snow in Winter

two rendering the vegetation non-poisonous to grazing animals. The cost of treatment varies widely with the chemical used, the climate and other conditions, and according to the report cited above, ranges from $7 to $41 per mile per application. In general, one application per season will suffice. The prevailing practice is to apply a fine spray of a fairly concentrated solution, although at least one railway has obtained more permanent results by applying approximately the same quantity of chemical in a weaker solution, thereby obtaining more of a drenching effect, but incurring greater expense for water and for the hauling of more tank cars in the train. That the effect of weed poisoning is carried over into subsequent years is indicated by the foregoing table of chemical application on three railways over a period of four years. It is to be observed that the full effect of treatment in previous years in terms of a reduced average consumption per mile can not be shown because each railroad treated additional new mileage each year. However, the downward tendency is clearly indicated.

Weeds can be removed at a marked saving by burning, modern equipment of this kind being operated at a cost of from $12 to $14 per mile per double burning, namely, one movement to kill the weed growth and the second to burn it after the vegetation has dried. However, as the roots are not killed, it is frequently necessary to make two and, in latitudes of long summer seasons, three double burnings to keep the track clean. Most of the equipment employed for the purpose comprises gasoline-engine propelled outfits equipped with a furnace for burning kerosene, distillate, or fuel oil.

In Next Week's Issue

An important opportunity for operating economies is to be found in the application of modern machine methods in railroad accounting work. Railroads were pioneers in the adoption of machine accounting methods and accounting officers have always been alert to opportunities for savings which these machines present. Recently manufacturers have been more intent than ever in producing machines designed to meet railway requirements. Some of the outstanding applications of these methods will be outlined in next week's article in our Operating Economy Series. Therein it will be shown that the accounting department offers opportunities as important as those to be found in other departments for the profitable investment of capital.

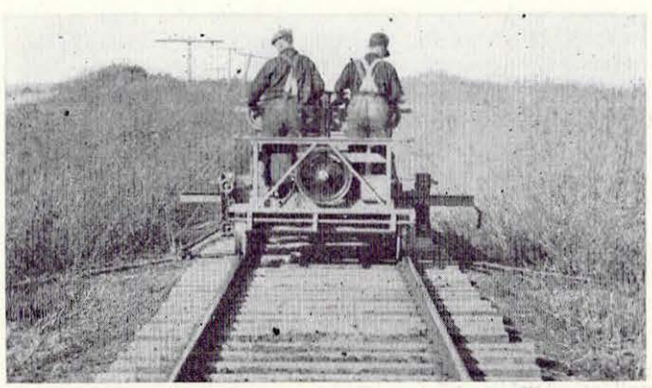
Weed burning is done entirely by company forces, a small part of the total mileage by means of large car-mounted plants operated in trains but by far the greater bulk of the mileage with self-propelled equipment that is available in the market as regular commercial equipment. Chemical application may be made either by company forces or by contractors who supply the application equipment ready to be mounted on flat cars. The contractors have had long experience and in recent years have effected improvements in the spraying equipment that permit of better control of the application and greater speed of the application train. A recent development is the introduction of portable containers for the hand application of liquid or dry chemical to small weeded areas that cannot be reached by track equipment.

Some species of weeds are eradicated effectively by exposing their roots to the air during periods of hot dry weather. This principle can be put into practice with economy in some territories by the use of motor-car propelled discers, which will turn over the ballast from the ends of the ties to the toe of the ballast shoulder on both sides, at a cost of $1.50 to $10 per mile. This practice is both cheaper and more effective in light ballast than in heavy ballast.

Hand Mowing Costly

For that portion of the right-of-way beyond the ballast line it is possible to save from $20 to $30 per mile by the elimination of hand labor in the annual mowing of weeds and grass that is required in many states by statute and must be done in many localities to reduce the fire hazard. It is also advisable in some areas as a means of gradually replacing weeds by a growth of grass. In some cases, where the mowing is limited to two swaths on each side of the roadbed, the possible saving will be

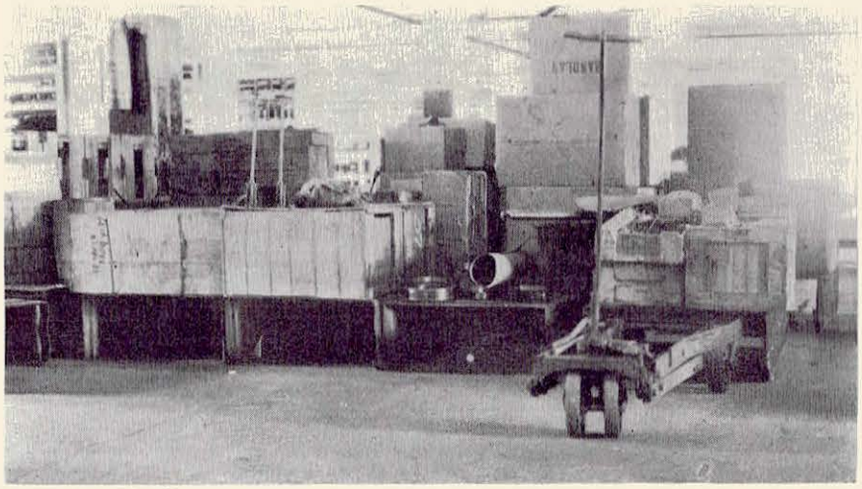
(Continued on page 552)



Machines Like This Cut Grass and Weeds Much Cheaper Than it Can be Done by Hand

Ship 80 Per Cent by Container On Big Four

Lift-truck investment paid off in two years by savings in supply work



Material on Skids for Shipment

THE BIG FOUR has a material-handling operation at Beech Grove, Ind., near Indianapolis, which lays claim to prominence for two reasons: (1) Because of the unusually wide application of container methods in supply work and (2) because of the economies produced. Lift trucks and skids are used not only to move material from cars to storage and from storage to cars, but also for the storage of an unusually large tonnage of material. About 80 per cent of the supplies loaded for outlying stores is shipped on skids and about 60 per cent of the material from outside stores is received on skids. In addition, 85 per cent of the material for the reclamation plant is handled on skids, while all the scrap brass is shipped to market and all new brass is handled in this way. From the beginning, the lift-truck operations have shown a saving in dollars and cents which has more than justified the equipment. The saving from the first year's operation was greater than the original expenditure, while in the two years during which the method has been used, sufficient payroll savings have been made to liquidate the entire investment.

The material-handling equipment used by the stores and shops at Beech Grove includes tractors and trailers and other accessories, as well as lift trucks and skids, as follows:

Tractors	12
Tractor-trailers	361
Lift trucks	5
Hand lift trucks	12
Lift-truck skids (all types)	2109
Crane trucks	3

This list does not include two overhead cranes and six locomotive cranes available at Beech Grove for handling material, and two highway trucks. All the skids and tractor-trailers at Beech Grove are placed in a pool from which each department draws as required, this practice having been adopted because of the impracticability of keeping the skids of each department separated.

Handling materials by skids was begun in June, 1929, with the purchase of one low-lift truck and two high-lift trucks, 9 hand-lift trucks, 452 flat skids and 413 skid boxes, and this equipment was increased at intervals of three or four months as the work developed. The savings reported for the container methods are more pronounced in view of the quantity of other mechanical facilities available prior to the introduction of the skids.

How Skids Are Used

The skids are all of the metal type. The practice is not to use the lift truck to the exclusion of other mechanical facilities, but to get the most out of each form of equipment by using it with other equipment, where the circumstances of each handling operation suggest. Thus, material is not ordinarily stored on trailers, with the exception of a few cases where the shops use trailers for storing cumbersome parts stripped from locomotives undergoing repairs. Rather, the skids are used for storage purposes, particularly by the store department, and to a lesser, though noticeable degree, by the shops whenever the character of material and the possibility of saving labor and time in moving material to or from storage favors such handling. The location of the point of use or storage of material has a large bear-

ing on the handling practice. If the destination can not be reached by concrete or plank runways, the movement is likely to be made by tractor and trailers because of their greater ground clearance, and the same practice governs where a considerable quantity of material is moved some distance. It is not uncommon to operate trains of from 4 to 15 loaded trailers under the control of but one man operating a tractor.

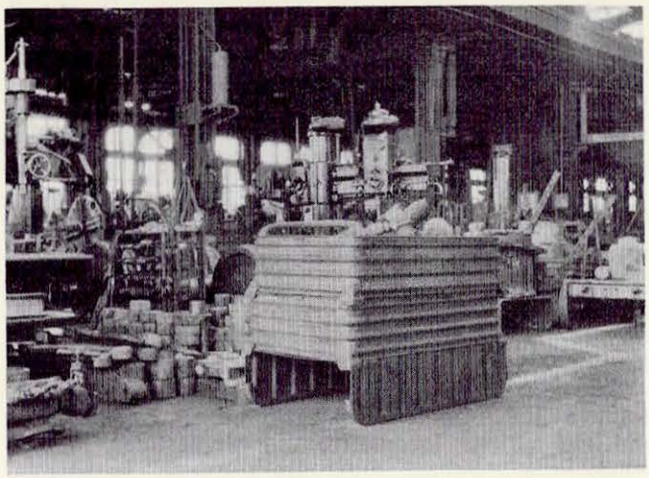
Where the material is already stored on skids or where skids are loaded for shipment to outlying stores or where a saving in labor or time is possible at some other destination by using skids and where at the same time the haul or the quantity of material is considerable, the most economical handling is usually obtained by hauling loaded skids on trailers to destination where another lift truck removes the skids.

The store department does not deliver material to the shops in view of the existing shop craft agreements, but materials which are stored on skids as well as materials to be repaired in the shops are taken to the shop by lift trucks operated by shop forces, following which the skids are either loaded with material that is being returned to the stores or the empty skids are placed in a convenient place outside of the shop door for the storehouse trucks. Cooperation between the stores and shops is furthered by placing all the skids at Beech Grove in a pool from which each department draws as required, this practice having been adopted because of the impracticability of keeping the skids of each department separated.

Rip Out Shipping Counters

The extension of the container methods to the distribution of supplies to outlying points has been accomplished with little trouble. There are 15 stations which regularly receive supplies direct from the general store, including small local stores. Some of these points are served daily; others require two cars a week on the average; others receive about a car a week; while some points are adequately served with a car once every two weeks. Thirteen of the hand-lift trucks purchased by the store department are distributed among the smaller stores and, where necessary, platforms, car-floor high, were built so that skids can be transferred by hand-lift trucks into and out of the cars.

On the second floor of the general storehouse where the smaller materials are assembled for shipment, the shipping counters previously required for wrapping, labelling and otherwise preparing supplies for shipment, have been ripped out and all materials adapted to



A Skidload of Locomotive Parts to be Repaired and Returned to the Shop

skid movement are assembled on skids which are moved about on the floor by hand-lift truck. From 1 to 50 different kinds of material are sometimes placed on the skids. When ready for shipment, the skids are moved by power-lift truck to the car. Cars loaded with material in skids are scheduled for departure on certain days and by switching the cars not later than 4:30 p.m. they are placed in trains for "high-ball" movement, with the result that all stores but one receive their cars not later than 10 o'clock the following morning with most of the material on skids, so that it is a simple matter to unload these cars by hand-lift truck.

Similar to the practice at Beech Grove, the local stores may hold the skids under load or place them at local repair tracks or in the roundhouses until the material is used, thus avoiding rehandling by store or shop forces. Empty skids in excess of the number required at local stores are returned empty, but most of the skids received by the local stores return to the general store loaded with material being shipped to the shop for repairs, or with scrap, etc. At some stores, special skids serve virtually as bins in which scrap is placed as it accumulates, thus making it unnecessary to spend the time in rehandling the scrap for shipment.

Kinds of Material Handling

With curtailed operations, the number of skids under load at present is larger than would be the case during a normal shop operation, but it is indicative of

Handling Brake Shoes by the Skidload

the size and scope of the container operations that a check at Beech Grove on June 1 showed 902 skids under load, distributed as follows:

Material in storage	577
Material for shipment to outside points	63
Material received from outside points	36
Scrap material going into reclamation plant for repairs	189
Reclaimed material going to stock	27

The stored material consisted of skidloads of journal brass, brass castings, oil boxes, brake shoes, brake beams, couplers, draft gears, locomotive grates, air-brake material and signal hose, oil-box lids, knuckle pins, coil springs, triple valves, valve-gear parts, coupler yokes, babbitt, angle cocks, cut-out cocks, retaining valves and other materials of a similar nature.

Skidloads of material awaiting shipment to outside points included brake shoes, brake beams, couplers, coil and leaf springs, locomotive and car castings, journal brass, brass castings, draft gears, "dope" in barrels, paint in buckets, loose bolts, kegs of bolts, nuts, washers, staybolts, nails and rivets; also angle bars, switch stands, locomotive and car forgings, bulky air-brake supplies, lubricators, injectors, stoker and booster material, locomotive grates, coal, coke and charkett, asbestos cement, coupler yokes, oxygen and acetylene tanks, etc.

The skidloads of material received from outside points consisted of headlight armatures, generators, bolts, brake beams, brass borings, angle bars, hand tools, carboys, cab curtains, cans, couplers, old dope, forgings, hose, injectors, jacks, knuckles, lanterns, scrap paper, springs, oxygen and acetylene tanks, and material of like nature.

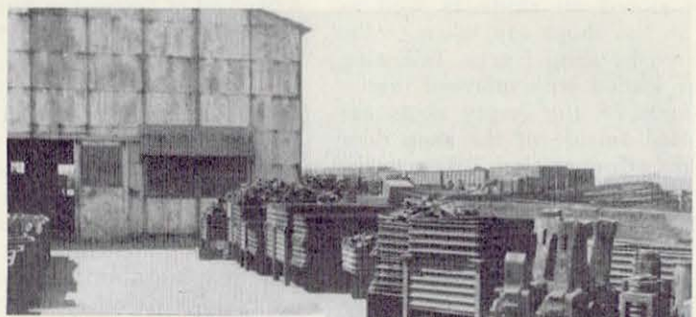
The skidloads of scrap material awaiting movement to the reclamation plant for repairs contained couplers and parts, safety traps, angle and cut-out cocks, brake levers, bottom connections, dead lever guides, coil springs, oil-box lids, air-brake and signal hose, yoke keys, all track tools, coupler yokes, draft arms and other miscellaneous materials.

The skidloads of reclaimed material awaiting movement to stock consisted of material similar to that in the skids for the reclamation plant, while the skidloads of material awaiting movement to the shop for repairs consisted of triple valves, driving boxes, crosshead shoes, injectors, lubricators, and other locomotive material coming in from outside points for repair.

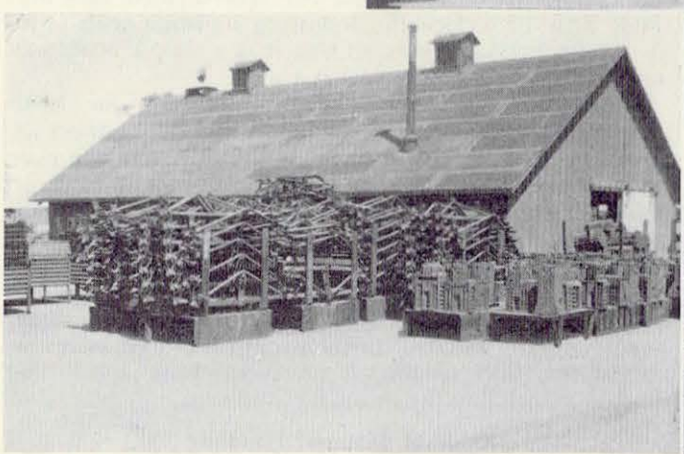
Factory to Consumer on Skids

The handling of brass illustrates the completeness with which much of the material handling is performed. All scrap brass is shipped to manufacturers about 200 miles distant in skids and new brass of all kinds is received on skids. The heavy brass, as well as car journal brass and bushings, are all stored on skids. As the journal brass arrives, it moves in the same skids to the broaching machine, passes from the machine into an empty skid, after which 99 per cent of the shipments to outside points are made without removing the material from these skids.

Right — Material Sorted from Scrap Awaiting Repairs



Below — Engine Brass in Skids as Received from Foundry



Above—Repaired Brake Beams for Shipment on Skids to Outside Stores and Draft Gear Awaiting Repairs

Labor Savings and Stock Reductions

The savings from the operations are savings in labor for both shop and store forces in handling and rehandling material, and savings in time, while the container method of storing and shipping large quantities of material has had a considerable influence upon the stock. Local stores operate on a 30-day stock or less. While lift-truck and skid equipment is not being utilized to capacity at the present time with the reduced operations, it would be impossible, Mr. Landers has pointed out, to carry on with the present forces if it were not for this equipment.

Four-System Plan Submitted to I. C. C.

Agreement reached on which major Eastern roads are prepared to unify

WASHINGTON, D. C.

A COMPLETE four-system plan for the grouping of the eastern railroads (excluding those in New England), on which a general agreement was announced last January, was submitted to the Interstate Commerce Commission on October 3, with an application for a modification of the commission's consolidation plan of December 9, 1929, which provided for five eastern systems. The filing of the application was in accordance with a final agreement reached by the executives of the four systems in New York on October 1 including several details of the plan which were still in process of determination or adjustment in January when the general agreement was announced and which had been the subject of numerous further conferences.

It was signed by Daniel Willard, president of the Baltimore & Ohio; J. J. Bernet, president of the Chesapeake & Ohio; P. E. Crowley, president of the New York Central, and W. W. Atterbury, president of the Pennsylvania, who asserted that in their judgment the proposed plan is "pre-eminently the best solution of the problem of railroad consolidation in the Eastern territory, excluding New England, which can be effectuated."

They also stated that they proposed, if and when the commission shall approve the changes in its plan so as to provide for the incorporation therein of the four-system plan, to proceed with the formation of unified systems pursuant to the plan in accordance with applicable provisions of law and on such terms and conditions as may be definitely submitted to the commission and found by it to be just and reasonable in the premises.

The commission was asked to re-open its consolidation plan proceeding for further hearings, which will doubtless be held. If it accepts the principle that the public interest will best be served by combining the eastern roads into four systems instead of the five proposed in its plan, further proceedings would be necessary on separate applications for acquisition or consolidation of the various railroads. These separate proceedings would deal with the questions as to whether the individual acquisitions are in the public interest and whether the terms and conditions are just and reasonable. No terms or conditions are involved in the present application but any modification made by the commission in its plan would be predicated on the assumption that the individual acquisitions would be on reasonable terms. It is also understood that if the commission, in making a decision on the application, should realign the allocations, the railroads are not bound to the allocations they have agreed upon but might find it necessary to engage in further negotiations.

Eight Years of Effort to Agree

The final filing of the application represents the culmination of efforts of the eastern executives extending over a period of about eight years to reach an agreement among themselves on a plan of consolidation to be recommended to the commission. In 1924 a four-system plan was informally submitted to the commission but with a minority report from the Pennsylvania and in 1929 applications in general accord with the four-system plan were filed by the Baltimore & Ohio and Chesapeake & Ohio, but these were withdrawn at the request of the commission after it had issued its plan.

The general understanding reached as to the allocation of the large roads in the eastern district was stated in a letter to the commission on January 2 and has not been changed, but certain points then referred to as not complete have now been determined or adjusted as the result of further conferences, including an allocation of 107 short line railroads and various trackage and terminal grants essential to round out the four systems.

Many Compromises Necessary

In this adjustment it is apparent that some important compromises were necessary and the plan has been submitted to the commission without a final determination as to some of the questions involved.

For example, the application does not propose trackage rights for the Pennsylvania over the Nickel Plate line from Ashtabula, Ohio, to Brocton, N. Y., which the Pennsylvania has been represented as insisting upon and the New York Central as vigorously opposing. It is understood that this does not foreclose the right of the Pennsylvania to bring up the point at some later time, but that it has relinquished its insistence at this time to remove an obstacle to an agreement. The New York Central is also understood to have refrained from pressing certain claims which would have complicated the negotiations, one of which is reported to have involved its right to an entrance to Philadelphia.

The Virginian, according to the plan, is to be jointly owned and operated by the Chesapeake & Ohio and the Pennsylvania, and the New York Central is to have joint rates and through routes over it. The commission's plan allocated it to the New York Central and there had been some discussion of a plan for dividing the property between two systems. At one point in the negotiations this was referred to arbitration but an understanding was reached which made this unnecessary.

An entrance to Manhattan Island for the Van Sweringen system is provided by the allocation to it of the Lehigh Valley, which in the commission's plan was put into the Wabash system, and by the provision for trackage over the Pennsylvania into its New York terminal.

Provision is also made for trackage for the Baltimore & Ohio over the Pennsylvania between Sinnemahoning or Driftwood, Pa., and Williamsport, which with the other lines assigned to the B. & O., would connect up its proposed short line between New York and Chicago. A shorter line for the New York Central also is provided through the use of trackage over the Reading from Newberry Junction, Pa., to Rupert.

The allocation of "bridge" and terminal lines provides equal and open access to the New England gateways, the Pittsburgh district and certain other strategic points to all.

The principal change proposed in the commission's

plan is the elimination of the Wabash-Seaboard-Norfolk & Western system, as to which, the application says, insuperable difficulties were found.

The Make-Up of the Four Systems

The New York Central system, as proposed, consists mainly of lines which it now leases or controls, with the addition of the Delaware, Lackawanna & Western, in which it has already acquired a substantial position, the New York, Ontario & Western, and the Ulster & Delaware, which it has offered to acquire on terms prescribed by the commission.

The lines included in the Pennsylvania system, as proposed, except short lines, are already practically within its control, directly or indirectly, if the Norfolk & Western may be so classed, but the commission has ordered it to divest itself of the stock of the Wabash and Lehigh Valley as the result of a Clayton act proceeding.

The Baltimore & Ohio has recently acquired control of many of the lines assigned to it and has about 47 per cent of the stock of the Reading, while the New York Central has 25 per cent. It also has almost a control of the stock of the Western Maryland, but is under a Clayton act order to dispose of it, the effective date of which has been postponed. Additional properties assigned to it are the Ann Arbor, the Lehigh & Hudson River and the Monon.

The Chesapeake & Ohio system as proposed consists mainly of properties now controlled by the Van Sweringen interests, plus the Chicago & Eastern Illinois, on which they have an option, the Bessemer & Lake Erie, controlled by the U. S. Steel Corporation, and the Lehigh Valley, controlled indirectly by the Pennsylvania. Control of the Wheeling & Lake Erie is owned by the Nickel Plate but is trusteed under an anti-trust proceeding.

The plan would leave the Pennsylvania as the largest of the four systems, both as to mileage, investment and earnings. It would have about 16,500 miles, as against 11,000 for the Baltimore & Ohio system, 12,500 for the Chesapeake & Ohio, and 13,000 for the New York Central. Its investment would be approximately $3,300,000,000, against $2,000,000,000 for the Baltimore & Ohio, $2,000,000,000 for the Chesapeake & Ohio, and $2,500,000,000 for the New York Central. The net railway operating income on the 1929 basis compared as follows: Baltimore & Ohio, $90,000,000; Chesapeake & Ohio, $113,000,000; Pennsylvania, $205,500,000; New York Central, $130,000,000.

Comments on Commission's Plan

Commenting on the commission's plan of 1929 the application points out that it was largely based on a record closed in October, 1923, following hearings on the tentative plan promulgated in 1921, and that there was not before the commission a complete or adequate showing of the conditions existing as of the date of the plan. Meanwhile, since the closing of the formal record, there had occurred many and important changes of conditions affecting railroad properties. Acquisitions of interests or control, complete or partial, of carriers, through stock ownership, lease, or sale, had taken place; new industries and traffic had been developed; changes in rates, routes and movements of traffic, both freight and passenger, had occurred; new and competitive forms of transportation had come into being or extended their scope; and new lines of railroad had been built, old lines abandoned, and facilities improved, approximately $4,100,000,000 having been added to the net investment in road and equipment in the six years 1924-1929, inclusive. Moreover, as to the effect of these and other types of changed conditions there neither was nor upon the record could have been a presentation of views by the carriers interested.

Systems Nos. 3, 4, 5, and 6, as set forth in the plan were built up around the systems of the applicants.

With respect to by far the greater part of the allocations made to those systems, the study made by the applicants has led them to agree with the conclusions of the commission, it being contemplated that over 95 per cent of the mileage allocated in the commission's plan to those systems, respectively, shall remain allocated to the same systems.

"While in respect of the remaining allocations to those systems, and also in respect of the failure to make certain allocations to them, grave difficulties were encountered," the application says, "it is unnecessary here to state these in detail; for in their study of System No. 7—Wabash-Seaboard, the difficulties were found and are believed by the applicants to be insuperable. It has, therefore, seemed to the applicants that if progress was to be made in furthering the national policy of consolidation, it would be necessary to reallocate the railroad properties included in proposed System No. 7 among other systems.

Changes Proposed in Commission's Plan

"Accordingly, following the publication of the commission's plan, and with the purpose of preserving and protecting their own interests in a manner which would, at the same time, promote the public interest and the national policy more effectively than the commission's plan, the applicants have held many conferences with one another, seeking to reach an agreement that would effectuate the purposes aforesaid. It was a further purpose of the applicants in seeking to reach an agreement to be able to afford the commission the assurance, necessary to the accomplishment of any plan of voluntary consolidation, that adequate financial resources would be marshalled in support of the plan."

The changes proposed to be made in the commission's complete plan are as follows:

1—The Delaware & Hudson from System No. 1-Boston & Maine to joint ownership by the Four Systems.
2—The New York, Ontario & Western from System No. 2-New Haven to System No. 3-New York Central;
3—The Lehigh & Hudson River from System No. 2-New Haven to System No. 5-Baltimore & Ohio;
4—The Lehigh & Hudson River from System No. 2-New Haven to joint ownership by the Four Systems;
5—The Virginian from System No. 3-New York Central to joint ownership by Systems No. 4-Pennsylvania and No. 6-Chesapeake & Ohio-Nickel Plate;
6—Detroit, Toledo & Ironton from joint ownership by Systems No. 5-Baltimore & Ohio and No. 7-Wabash-Seaboard to System No. 4-Pennsylvania;
7—The Delaware, Lackawanna & Western from System No. 6-Chesapeake & Ohio-Nickel Plate to System No. 3-New York Central;
8—Wabash, Toledo, Peoria & Western and Norfolk & Western from System No. 7-Wabash-Seaboard to System No. 4-Pennsylvania;
9—Lehigh Valley, Wheeling & Lake Erie and Chesapeake & Ohio of Indiana from System No. 7-Wabash-Seaboard to System No. 6-Chesapeake & Ohio-Nickel Plate;
10—The Pittsburgh & West Virginia, except that portion west of Gould's Tunnel, and the Akron, Canton & Youngstown from System No. 7-Wabash-Seaboard to joint ownership by the Four Systems, and that portion of the Pittsburgh & West Virginia west of Gould's Tunnel from System No. 7-Wabash-Seaboard to System No. 6-Chesapeake & Ohio-Nickel Plate;
11—Western Maryland and Ann Arbor from System No. 7-Wabash-Seaboard to System No. 5-Baltimore & Ohio;
12—Chicago & Eastern Illinois from System No. 11-Chicago

& North Western to System No. 6-Chesapeake & Ohio-Nickel Plate;

13—Chicago, Indianapolis & Louisville from joint ownership by Systems No. 5-Baltimore & Ohio, No. 8-Atlantic Coast Line and No. 9-Southern to System No. 5-Baltimore & Ohio.

14—The Monongahela from joint ownership by Systems No. 3-New York Central, No. 4-Pennsylvania, and No. 5-Baltimore & Ohio, to joint ownership by the Four Systems;

15—Pittsburgh, Chartiers & Youghiogheny from joint ownership by Systems No. 3-New York Central, and No. 4-Pennsylvania, to joint ownership by the Four Systems;

16—Montour, not allocated in said plan, to joint ownership by the Four Systems;

17—Other allocations of carriers, principally short lines and connecting and terminal railroads, other arrangements, and trackage and other rights, all as particularly set forth in detail in the Four-System Plan.

Wherever a carrier or property is named, unless an exception is particularly named, it is intended to include all subsidiary owned, controlled, leased, or operated lines.

The Four-System Plan

The effect of making the changes and modifications of the commission's plan, as above set forth, would be to group the railroad properties of Eastern territory (excluding New England except the Boston & Albany which is leased to and a part of the New York Central and in the commission's plan is allocated to System No. 3-New York Central) into four systems, as follows (trackage rights omitted):

System No. 3—New York Central

New York Central Railroad
  Fulton Chain
  Raquette Lake
  Chicago River & Indiana
  Louisville & Jeffersonville Bridge & Railroad
  Muncie Belt
  Federal Valley
Pittsburgh & Lake Erie
  Lake Erie & Eastern
Delaware, Lackawanna & Western
  Harlem Transfer Company
New York, Ontario & Western
Ulster & Delaware

System No. 4—Pennsylvania

Pennsylvania Railroad
  Long Island
  Baltimore & Eastern
  Pennsylvania & Atlantic
  Philadelphia & Beach Haven
  Rosslyn Connecting
  Waynesburg & Washington
  Western Allegheny
  Philadelphia & Camden Ferry
Toledo, Peoria & Western
Norfolk & Western
Wabash
  New Jersey, Indiana & Illinois
  Detroit & Western
Detroit, Toledo & Ironton

System No. 5—Baltimore & Ohio

Baltimore & Ohio
  Baltimore & Ohio Chicago Terminal
  Dayton & Union
  Staten Island Rapid Transit
Reading Company
  Atlantic City Railroad
  Peoples Railway
Central of New Jersey
Lehigh & Hudson River
Western Maryland
Ann Arbor
  Manistique & Lake Superior
Buffalo, Rochester & Pittsburgh
Buffalo & Susquehanna
Chicago & Alton
Chicago, Indianapolis & Louisville

System No. 6—Chesapeake & Ohio-Nickel Plate

Chesapeake & Ohio
  Covington & Cincinnati Elevated Railroad & Transfer & Bridge Company
Pere Marquette
  Flint Belt
New York, Chicago & St. Louis
Erie Railroad
  Chicago & Erie
  New York, Susquehanna & Western
  Wilkes-Barre & Eastern
  New Jersey & New York
  Bath & Hammondsport
Lehigh Valley
Bessemer & Lake Erie
Chicago & Eastern Illinois
  Chicago Heights Terminal Transfer
Wheeling & Lake Erie
  Lorain & West Virginia
Pittsburgh & West Virginia (West of a point at or near Gould's Tunnel)
Pittsburg & Shawmut
Pittsburg, Shawmut & Northern
Detroit & Mackinac
Manistee & Northeastern
New Construction—Portland, N. Y., to Portage, N. Y.

Joint—New York Central, Pennsylvania, Baltimore & Ohio and Chesapeake & Ohio-Nickel Plate

Delaware & Hudson
  Cooperstown & Charlotte Valley
  Greenwich & Johnsonville
  Schoharie Valley
  Napierville Junction
Lehigh & New England
Montour
Pittsburgh, Chartiers & Youghiogheny—Trackage over the P. R. R. Woodville Jct., Pa., to Van Emman, Pa., to reach new construction of P. C. & Y. R. R. and Monongahela Railway, Van Emman to Clarksville, Pa.
Monongahela
  Pittsburgh & West Virginia (East of a point at or near Gould's Tunnel)
Elgin, Joliet & Eastern
Akron & Barberton Belt and Akron, Canton & Youngstown

Joint—New York Central and Pennsylvania

Central Indiana
Cherry Tree & Dixonville
Cambria & Indiana
Lake Erie & Pittsburgh

Joint—New York Central (60%), Chicago & North Western (20%) and Chicago, Milwaukee, St. Paul & Pacific (20%)

Indiana Harbor Belt

Joint—New York Central and Chicago, Rock Island & Pacific

Kankakee & Seneca

Joint—Pennsylvania and Chesapeake & Ohio-Nickel Plate

Virginian

Joint—Baltimore & Ohio and Chesapeake & Ohio-Nickel Plate

Detroit & Toledo Shore Line—one-half interest now owned by Grand Trunk to Baltimore & Ohio System and one-half interest now owned by Nickel Plate to Chesapeake & Ohio-Nickel Plate System.

All established and now existing through routes between the carriers comprising the four systems are to be maintained. The New York Central system is to have joint rates with the Virginian via Deepwater on westbound traffic; also, subject to the limitations of the law, on eastbound originating west of Swiss, W. Va.

The term "trackage," unless otherwise specified, means bridge trackage only. Each of the systems is to have the right to full trackage on reasonable terms over all or any part of any of the joint railroads in which an ownership interest has been allocated to such system.

Allocation of Short Lines

The remaining railroads in Eastern territory (excluding New England and except certain so-called "Terminal Properties" not allocated by the commission) have been allocated in the commission's consolidation plan, to Systems No. 3, No. 4, No. 5, No. 6 and No. 7. These railroads, consisting mainly of independent short lines and including a few jointly controlled connecting and terminal roads, 107 in all, are tentatively assigned to the four systems now proposed by adaptation and modification of the commission's five system allocation to conform to the proposed assignment of the principal railroads with which these short lines connect. In most cases the assignment made follows that indicated by the commission's plan. In some few instances the commission's allocations have been appropriately modified and 26 plant facility and industrial common carrier railroads have not been allocated to systems.

The allocation of such railroads other than those named in the four-system plan, it is stated, is necessarily tentative and subject to change by the commission, upon its own motion or upon application of the carriers in-

volved, as may be found appropriate in the public interest.

Proposed Modifications Would Promote the Public Interest

The applicants allege that it would promote the public interest for the commission to change and modify the commission's plan to such extent, but only to such extent, as may be necessary to provide for the incorporation therein of the four-system plan, for the following reasons:

(1) Carriers Representing the Major Part of the Properties Involved Unite in Submitting the Four-System Plan.

The consolidation policy adopted by Congress is one to be effected by voluntary action and assent of the carriers involved, subject to the necessary finding by the commission, in each case, that the public interest will be promoted by what is proposed and that the conditions of Section 5 of the interstate commerce act have been or will be fulfilled. Because of the greater likelihood of accomplishment, it is submitted to be manifestly in the public interest and in consonance with the declared policy of Congress that the carriers representing the major part of the properties involved in a consolidation plan for any district should unite, as here, in an agreed plan to be submitted for the commission's approval.

(2) Four-System Plan would Meet the Essential Requirements of the Law.

The proposed Four-System Plan would meet the essential requirements of Section 5 of the interstate commerce act that in the division of railway properties into systems competition shall be preserved as fully as possible, and that wherever practicable the existing routes and channels of trade and commerce shall be maintained, and that, subject to the foregoing requirements, the several systems shall be so arranged that the cost of transportation as between competitive systems and as related to the values of the properties through which the service is rendered shall be the same, so far as practicable, so that these systems can employ uniform rates in the movement of competitive traffic and under efficient management earn substantially the same rate of return upon the value of their respective railway properties.

(3) Four-System Plan Provides for All the Carriers in Eastern Territory (Excluding New England).

The proposed Four-System Plan provides for the allocation of all or substantially all the carriers, large and small, in Eastern territory, outside of New England. It is a practical plan for effectuating the Congressional purpose and intent in respect of railroad consolidations and the co-operative use of railroad facilities, and contributes to the establishment of an efficient national railway transportation system.

(4) Main Stems and Direct Routes.

Each of the proposed four systems would have adequate main stems between the Atlantic Seaboard and the Middle West, and direct routes between important cities and industrial centers.

(5) Producing, Consuming and Population Centers.

Under the proposed Four-System Plan nearly all of the principal producing, consuming and population centers of Eastern territory, excluding New England, would be served by two or more and in many instances by all four systems.

(6) Access to Fuel Supply and Commercial Distribution of Coal.

Each of the proposed four systems would have access to sources of fuel supply as well as participation to a large extent in the commercial distribution of coal.

(7) North Atlantic Ports.

Each of the proposed four systems would have access to at least two of the five principal North Atlantic ports, and none of these principal ports would be without competitive service.

(8) Lake Ports, Ohio River Crossings and Lake Michigan Ferry Routes.

Each of the proposed four systems would have substantial access to the lower Great Lake ports, Ohio river crossings and Lake Michigan ferry routes, and thus participate in the transportation of the large volume of traffic passing through and over them.

(9) Physical and Financial Strength.

The four systems proposed would have the necessary physical and financial strength to serve the public efficiently and economically and to coordinate their services with waterways, highways, airways and other modern means of transportation.

(10) Four Systems Would Assure More Effective Competition Than a Greater Number of Systems.

In addition to their physical and financial strength the four systems proposed would be well articulated and reasonably balanced with one another and would thus assure a greater amount of actual and effective competition than would be possible with any number of systems in Eastern territory greater than four.

FOUR-SYSTEM PLAN CALLED THE BEST THAT CAN BE EFFECTUATED.

As declared in the letter of January 2, 1931, from the presidents of the applicants to the commission, the agreement set forth in that letter in respect of the Four-System Plan is interdependent and could not have been reached upon any different basis of allocation. Probably no single one of the groups herein proposed is exactly what those interested in the group would wish it to be. In order to reach a common understanding it has repeatedly been necessary for all of the interests involved to make concessions. It is believed, however, that each of the systems resulting from the suggested grouping will be able to operate more efficiently and serve the public better than the same number of miles operated in a less coordinated manner as at present. The applicants accordingly say that they are unable to present any other changes or modifications than those herein proposed. In their judgment the proposed Four-System Plan is pre-eminently the best solution of the problem of railroad consolidation in the Eastern territory of the United States, excluding New England, which can be effectuated.

Fighting Snow—Killing Weeds

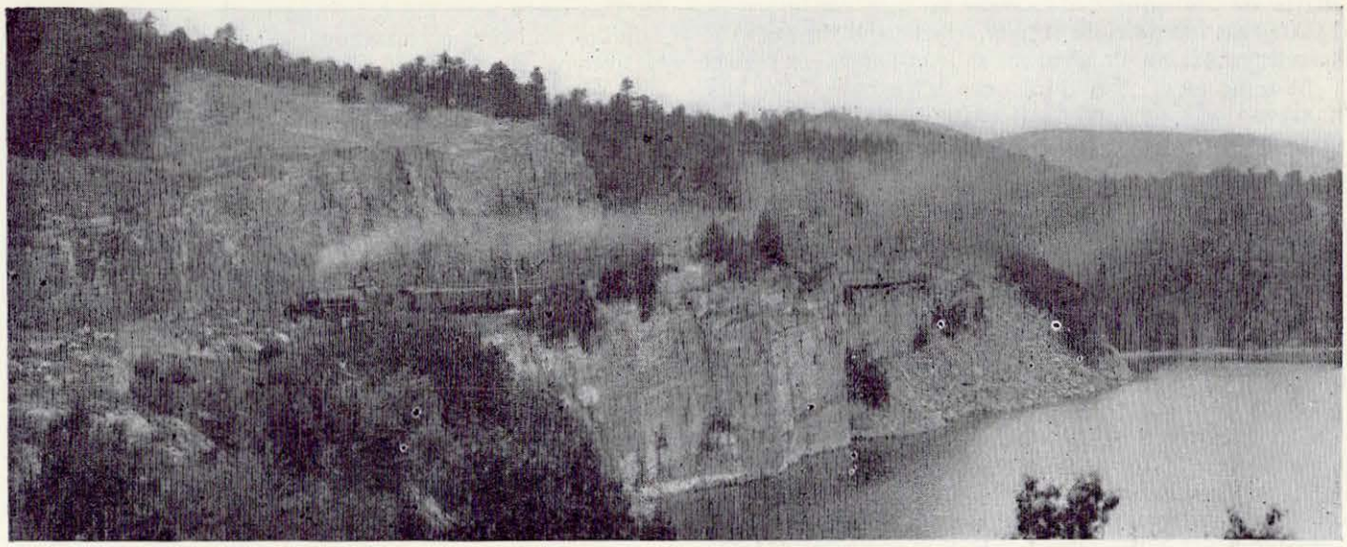
(Continued from page 545)

less because the outlay for hand labor is less, but the proportionate reduction in cost will be greater. Such mowing, if done by trackmen with scythes, costs about $20 per mile whereas power mowers drawn by track motor cars will do this work for about $4. These machines have proved thoroughly practicable and are designed for ready adjustment of the sickles to the contour of the ground.

Where the entire right of way must be cut, the mowing of the portion beyond the reach of the track-operated machine can be done by horse-drawn mowers at a saving of more than half the cost of hand mowing, if the ground surface is sufficiently even to permit of the operation of farm mowers.

The machinery and methods now available to meet the problems imposed by the growth of weeds and other vegetation permit of the exercise of considerable discrimination in the choice of the means that will be found best suited to the local conditions. It is certain also that whatever solution is adopted it will prove more economical than resort to manual effort.

EDMUND DESCHENES, manager of the Central Vermont, has been appointed chairman of the Franklin County, Vt., committee on unemployment by Governor Stanley C. Wilson. The chief executive of the state has appointed a general committee with representatives from each of the state's 14 counties. Manager Deschenes was named to head the Franklin County delegation.



The Line of the Delaware & Hudson Along Lake Champlain

Statistics Pay Their Way

Delaware & Hudson officers get graphic studies of their operations

NO small part of the efficiency of operation on the Delaware & Hudson is attributed to the use of statistics by all operating officers. A description of the operating methods used in bringing about this efficiency appeared in the *Railway Age* of June 13, Pages 1143-5. Changes in methods were important, since statistics, however perfect, will not in themselves run a railroad, effect reforms, or secure efficiency. It has been found, however, on the D.&H., that comprehensive statistics are invaluable in affording knowledge which aids in the solution of operating problems and enables correct conclusions to be drawn.

The statistics are prepared in the office of the statistician for operations, whose staff draws the material from the daily operating reports. The timeliness of the statistics supplied has been an important factor in their success. A daily report, in the form of statistical tables and graphic charts, is on the desks of the vice president and of the assistant general manager every morning at 9 o'clock, giving a complete summary of the preceding day's operations. By means of comparison, any situation that seems to need correction is immediately apparent and the proper steps can be taken before the matter becomes history and is forgotten by all concerned in the rush of current business. All operating supervisors are also provided with a complete statistical survey periodically, so that not only the executives, but also the division officers are thoroughly conversant with costs and performances on each division. The presentation of performance records by means of statistical tables and graphic charts has become standard on the D.&H. One factor that has been of considerable advantage in this regard is the relatively small size of the D.&H., which permits the statistician for operation to place these reports in the hands of all division officers without a delay of more than eight hours.

The statistics are grouped under four general headings, as follows: Locomotives, cars, trains, and all others.

Locomotive Statistics

Locomotive hours and locomotive miles are the most important factors in the preparation of locomotive statistics, and all relative data developed are based on these factors.

The locomotive hours are divided into four classifications: Road time, time spent at terminals, time stored, and time unserviceable undergoing repairs. The road time by classes of service is obtained from the enginemen's time slips, and the other time is taken from the daily reports of the mechanical department. The number of locomotives by classes of service, and separated between those serviceable and those unserviceable, is obtained by dividing the total hours in each group by the total calendar hours in the month. The locomotive miles are obtained from the enginemen's mileage slips.

The record of light locomotive miles is maintained separately and watched closely, because of the non-revenue-producing nature of light miles. One of the operating averages drawn from the combination of locomotives and locomotive miles is "average miles per locomotive per day," which indicates the average distance run in 24 hours. Based on experience, a fixed standard has been worked out for each division, and this average provides a check as to whether more engines than necessary are being used.

The fuel is charged to the locomotives on the basis of hours in each class of service. The fuel consumption is expressed in two ways: "Fuel consumed per locomotive mile" and "Fuel consumed per 1,000 gross ton miles". Fuel records on a locomotive-mile basis are maintained by classes of service as well as by divisions and provide a check that indicates the increase or decrease in consumption on a unit basis. Figures and

charts are also provided to show the fuel consumed per 1,000 gross ton miles in freight service and the fuel consumed per passenger train car mile in passenger service.

As a means of providing a check to show if the locomotives are being used to their fullest extent, daily records are maintained showing the number of trains and the tractive power necessary to move such trains from all principal terminals on the D.&H. By means of this information, in conjunction with the engine rating, and the adjusted tonnage handled, a performance figure showing the percentage of rating hauled is produced.

In addition to the statistics portraying the performance of the engine while it is on the road, other statistics are prepared to show what takes place when an engine has completed its run. Daily figures are compiled showing the terminal time, and this report shows the time required to yard the train, clean the fire, and make any necessary light repairs; it also shows the delay from the time the locomotive is reported ready for service by the mechanical department until it is used by the transportation department. Records and graphic charts are also prepared showing by points the number of enginehouse employees, the man-hours worked, the engines dispatched, and the man-hours per engine dispatched. This provides a check whereby enginehouse forces may be maintained at a force consistent with the number of engines being handled.

As a safeguard and to prevent the depletion of potential locomotive miles, records are maintained of the locomotives undergoing classified repairs. Each locomotive, on being released from the shop after classified repairs, is given a potential mileage, and the aggregate of these miles for all locomotives released from the shop in a given period is expected to equal or exceed the mileage produced by active locomotives in the same period.

In order to control the locomotive operating costs, tabulations are made showing the following costs per locomotive mile operated: Repairs, fuel, wages, water, lubricants, and other supplies. In addition, the total amount of fuel, lubricants, and waste consumed is shown, as well as the cost and the mileage produced on a unit basis. This information, when compared with figures covering prior operations, gives the operating officer a picture of the trend of his locomotive costs.

Car Statistics

Daily records are maintained showing the total number of car movements, both loaded and empty, by direction and by division, as well as the total cars to be moved as of 6 a. m. daily. In the case of loaded cars, this supplies a day to day record of the volume of revenue business moving. In the case of total cars moved, it indicates the volume of work performed from the standpoint of expense. The report showing the cars on hand to move at 6 a. m., portrays the condition of the railroad and prevents any undue accumulation of cars. It is also essential to the proper operation of locomotives. Daily reports are kept on the number of cars interchanged, both loaded and empty, and a daily report is made of cars of all freight originating on the D.&H. From a study of these figures a close estimate of the proper number of locomotives necessary may be obtained.

The average delay to cars passing through yards is shown by a daily report, and further control of cars moving through yards is made possible by a daily record, maintained for all yards, of yard switch engine hours in relation to cars dispatched. If the number of cars dispatched per switch engine hour decreases, it supplies an indication that the switch engine hours are not keeping pace with the reduction in the number of cars handled and that a curtailment of yard engine hours is desirable.

Records are also maintained covering cars that are out of service. On cars awaiting repairs, a daily record is kept indicating by points the number of cars repaired. A record is also kept for all car repair points, which shows the number of men, man hours, cars repaired, and the man hours per car repaired, which assists in enabling the supervisor to regulate repair forces consistent with the number of cars being repaired.

To indicate comparative car costs, figures are compiled on a car-mile basis showing the cost of repairs, lubrication, lighting, heating, cleaning, and other supplies and expenses. These figures cover both freight and passenger car operations and portray graphically the trend of car costs.

The conductor's wheel reports are forwarded to the statistician upon the completion of each trip. There is then inserted, after each car or block of cars making the same movement, the mileage involved, the number of loaded and empty cars, and the total gross and net weight. Hollerith cards are punched for this information, involving approximately 35,000 cards per month. At intervals during the month, these cards are run through sorting and tabulating machines and the following information is developed by divisions and directions:

Loaded and empty car miles and gross and net ton miles, representing for each of these factors the number of units, multiplied by the distance moved.

Train hours, representing the elapsed time that trains were on the road between the initial and destination terminals.

Reports covering passenger car miles are compiled by trains and classified by types of equipment. Locomotive and train miles are developed from the enginemen's mileage slips and are compiled by divisions and classes of service. These figures, of course, indicate volume only, and they are used as the basis for developing various averages which are of importance in determining the efficiency with which the division is being operated.

Daily records are maintained showing the average time on the road for all trains in the principal freight pools, such as Wilkes-Barre-Oneonta, Carbondale-Oneonta, Binghamton-Mechanicville, Oneonta-Mechanicville, Oneonta-Whitehall, and Whitehall-Rouses Point. In this manner the supervisor may keep a constant watch on the operating costs and hold overtime to the minimum. Up-to-date reports covering train miles per freight train hour and net ton miles per train mile are supplied to all operating officers.

Compilations are made on the first and fifteenth of each month, which show the estimated operating revenue earned and the estimated operating expenses incurred, the expenses being sub-divided by departments to show maintenance-of-way, locomotive, car, traffic, transportation, general, and miscellaneous. In arriving at the estimated revenue earnings, consideration is given to the number of loaded cars moved in the period to be covered, as well as any influential changes in the character of traffic moved. With the report of expenses, the activities of the respective departments are reviewed thoroughly and an estimate made which also shows the ratio of each department's expense to the total revenue. Through experience and care, these estimates have come to be surprisingly accurate, and this information is considered of vital importance by the operating officers, since, being supplied two weeks in advance of the actual monthly figures, it affords advance information so that expenses may be controlled consistent with the business handled.

Hearings on Railroad Practices

Pittsburgh sessions, opening on October 5, scheduled to continue until October 17

HEARINGS in connection with the Interstate Commerce Commission's investigation of railway practices affecting operating revenues and expenses, which closed at New York on September 29, were resumed on October 5 at Pittsburgh, Pa., where the schedule calls for sessions until October 17. The proceedings, over which Director W. P. Bartel of the Interstate Commerce Commission's bureau of service is presiding, are under Part 2 of the general investigation contemplated in Ex Parte 104 and thus relate to terminal services of Class I railroads. Among the attorneys filing appearances at the opening of the Pittsburgh hearings was J. S. Burchmore, representing the National Industrial Traffic League.

Monongahela and Montour

The Monongahela was the first carrier to be heard; it presented the testimony of O. E. Schultz, general freight agent. Mr. Schultz stated that the Monongahela has no industrial common carrier connections nor does it grant allowances to any plants which perform their own spotting services. He continued, however, to explain switching arrangements which are in effect with the Redstone Central, a leased line, and with the Monongahela West Penn Public Service Company.

The Monongahela leases and operates the line of the Redstone Central, which serves a plant of the Buckeye Coal Company. Under the terms of the lease the Monongahela maintains the Redstone tracks and pays as rental 30 cents per car handled over them. This latter, calculated to give the Redstone a return of six per cent on its investment in the property leased, is based on the average number of cars handled annually for the Buckeye Coal Company. The Monongahela does not under the terms of this lease maintain any of the Buckeye Coal Company plant tracks.

In questioning the witness on this lease Director Bartel cited the six per cent return contemplated on the Redstone investment and asked if the Monongahela itself were earning a six per cent return on all or any part of its line. Mr. Schultz replied that such a return was, of course, not guaranteed but it was nevertheless aimed at. A. G. Hagerty, attorney for the commission, brought out that the Redstone Central is owned by the Youngstown Sheet & Tube Company, parent corporation of the Buckeye Coal Company.

The second arrangement explained—that with the Monongahela West Penn Public Service Company—involves the payment (subject to a maximum annual amount) of $6.50 per loaded car. The Monongahela West Penn Public Service Company is a common carrier but is not employed by the Monongahela in such capacity; it is merely employed to do certain switching to reach plants formerly reached only by absorption of Baltimore & Ohio switching charges. The $6.50 payment per car applies only if loaded cars per year are less than 1,200; if more than 1,200 cars are handled $5 per car is paid for the excess and if more than 2,400 are handled then the payment becomes $5 on all cars. This plan, it was stated, represents a substantial saving over the former arrangement whereby B. & O. switching charges were absorbed.

Attorney Hagerty developed that the Pennsylvania, the Baltimore & Ohio and the Pittsburgh & Lake Erie share equally in the ownership of the Monongahela and that 90 to 95 per cent of its revenue comes from its proportion of joint rates. The witness added, however, that the Monongahela is the originating carrier with respect to this inter-line traffic.

The brief presentation on behalf of the Montour was made by H. E. Sheets, traffic manager. He stated that 95 per cent of this road's revenue tonnage is bituminous coal and that no plants on its line perform their own spotting services. Neither does the Montour employ the services of any industrial common carriers. In only one instance, according to Montour tariffs, is a charge assessed in addition to the line-haul rate—provision is made for the stoppage at a cleaning plant of coal in transit.

Pittsburgh & Lake Erie

E. T. Sladden, general freight agent, was the first Pittsburgh & Lake Erie witness. Mr. Sladden opened with a statement citing tariffs covering terminal and accessorial services and outlining the history and present situation with reference to allowances made by the P. & L. E., first to short-line common carriers and second to plants performing their own switching. The P. & L. E., he said, provides crane service without charge at various points; it makes the usual absorption of connecting line switching charges and follows the general storage, diversion and reconsignment rules. It provides in its tariffs that it may unload carload freight for the purpose of releasing needed equipment and also will on request unload carload freight at Pittsburgh for a charge of 2½ cents per 100 lb. if the service is performed at a private siding and 1½ cents per 100 lb. if done at a public team track.

Director Bartel interrupted Mr. Sladden's reading to inquire about the absorption of line-haul charges at Pittsburgh, a situation which the Director said has been under investigation for some time by the I.C.C. The witness cited the tariff which precipitated the investigation referred to by Director Bartel. It covers a situation where the Pennsylvania does not switch for the P. & L. E. and thus, Mr. Sladden said, the P.R.R. line-haul charge was the only one available for absorption; the maximum absorption made is 73 cents per ton. Later in his testimony Mr. Sladden explained that at only two plants in the Pittsburgh district will the P.R.R. switch for the P. & L. E. The P. & L. E. itself not only publishes switching charges covering delivery at industries on its line but, unlike most roads appearing thus far in the hearings, opens its team tracks to connecting lines under its switching tariffs.

In outlining the history of allowances paid by the P. & L. E. Mr. Sladden stated that these payments were all cancelled in 1915 following a decision of the I.C.C. holding that they resulted in discriminations. Later they were gradually restored on a new basis,

following studies in each case, and reparation was paid for the interim between the cancellation and the reinstatement. Allowances are now paid to six common carriers and 14 plant facility railroads serving plants of the iron and steel industry. Payments to the common carriers are in general subject to minimum line-haul revenue requirements and vary from 10 to 16 cents per ton. The witness described the payments to these common carriers as an allowance which in effect amounts to an absorption by the P. & L. E. of a portion of their switching charges; the unabsorbed balance is paid by the shipper or consignee in addition to the line-haul rate.

Allowances made by the P. & L. E. to the 14 plants performing their own spotting, Mr. Sladden revealed, are on different bases; some provide for a payment per car, others are calculated on a per ton basis, while a third group provides for payment of actual spotting cost with a stipulated maximum. Allowances do not apply to ex-lake ore nor are they made on switched traffic; the line-haul carrier takes care of the payment in the latter case.

Director Bartel questioned Mr. Sladden on cases where an industry receiving an allowance is reached only by absorbing the switching charge of a connecting line. The switching tariffs, the witness agreed, are "wide open" and thus presumably contemplated spotting. He added, however, that the tariffs providing for the allowances exempt switched traffic even though, as the director pointed out, there is no reference in the switching tariff to the allowance tariffs covering the exemptions.

In explaining the different bases on which the allowances are calculated Mr. Sladden told Attorney Hagerty that these matters are all determined by the terminal allowance committee of the Central Freight Association. Thomas P. Healy, Washington, D. C., attorney representing the P. & L. E., introduced in this connection exhibits setting forth the formulae used in determining the allowances. Generally, the witness stated, the allowance should be on a per car basis; the ton is used only where special circumstances make it the more feasible unit. Mr. Burchmore, representing the National Industrial Traffic League, here brought out that most of the studies on which the allowances are based were made prior to 1917. The allowances granted in that period, it was also stated, were in no cases greater than the estimated cost to the railroad of performing the spotting services involved.

J. L. O'Toole, assistant to general manager, followed Mr. Sladden; his testimony related to the Lake Erie & Eastern as well as to the P. & L. E. Mr. O'Toole cited at the outset the one exception to the general rule on the P. & L. E. that the railroad either performs all spotting services or grants an allowance for such work. The exception is a plant which performs its own spotting without any allowance because it would not be physically possible for the P. & L. E. to do the work on account of curvature in the plant tracks.

Mr. O'Toole's attention was next directed to cases where the P. & L. E. brings cars to a track adjacent to a plant and then later spots these cars at the direction of the plant. As an example of such a situation the witness mentioned a plant of the Youngstown Sheet & Tube Company at East Youngstown, Ohio. Here the P. & L. E. does the spotting for all roads serving the plant and the work at present requires the services of 10 crews and seven locomotives per 24-hour day. The witness agreed to a calculation of Director Bartel's that the cost of serving this plant with 10 crews was about $600 per 24-hour day. He explained that at these plants the several carriers serving them have entered spotting agreements whereby the work at any particular point is done by the road which can do it most conveniently and economically. Locomotives are assigned in this manner only at iron and steel plants, Mr. O'Toole said, since no other industry served by the P. & L. E. is of sufficient magnitude to warrant such service.

N. I. T. League Wants Issues Defined

Mr. Burchmore precipitated considerable discussion at the opening of the October 6 session with his inquiry as to the specific purposes of the present investigation. The National Industrial Traffic League, he said, is interested in maintaining the principle of long-standing that the freight rate as published carries goods from the point of loading to the point of unloading. Does the inquiry, he asked, contemplate bringing to light irregularities in present practices or does it contemplate a new basis of broken-up rates? If the latter be the fact Mr. Burchmore submitted that the N. I. T. League would require time to call into play its resources to develop testimony in support of the present basis.

In reply Director Bartel reiterated the statement that he made at the New York hearing to the effect that he had no intention of recommending a separate spotting charge for switching to an ordinary private siding or public team track. As to the complicated plant layouts, the Director said, they represent another question. Mr. Burchmore then asked if he might advertise to the N. I. T. League that a separate charge is contemplated for spotting on anything other than a simple spur track. Director Bartel's reply was that he could not anticipate what recommendation would be made until he knew what facts were developed on the complete record of the present hearings.

Attorney Hagerty at this point suggested that the purpose of the inquiry is to develop the facts as to whether terminal services might be looked upon as a source of additional revenue or of reduced operating expenses for the carriers.

Following the foregoing discussion, the cross-examination of Mr. O'Toole was resumed but was soon interrupted again to permit the testimony of B. B. Rankin, assistant general auditor of the P. & L. E. Mr. Rankin answered questions based on items in the P. & L. E. annual report. In this connection the question of total payments for terminal services, which was the subject of a conference with accounting officers at New York, again came up. Director Bartel stated that the carriers report these deductions to the I. C. C. and thus presumably have the data to supply the breakdown into items requested by Attorney Hagerty. He intimated, therefore, that he would perhaps request the respondents to supply the information.

Upon his return to the stand, Mr. O'Toole was subjected to extended cross-examination by counsel other than I. C. C. attorneys. Mr. Burchmore stated that he would like to have Mr. O'Toole supply a map of the Youngstown, Ohio, district and submit to cross-examination with such a map before him. His aim, Mr. Burchmore said, was to bring out the whole picture with reference to terminal services at Youngstown. Attorney Healy stated in this connection that the P. & L. E. does not serve directly all plants at Youngstown and suggested that the general picture which Mr. Burchmore desired would develop on the record through the testimony of other carriers.

W. W. Collin, Jr., representing the Monongahela Connecting, developed through Mr. O'Toole the fact that at Pittsburgh the P. & L. E. has, at different locations, team tracks, crane facilities, an automobile-unloading platform and tracks serving a warehouse which

the railroad operates. The witness then agreed with Mr. Collin that the foregoing set-up roughly corresponds to the different departments or spotting points of a large plant. Mr. O'Toole could see no difference from an operating standpoint in rendering spotting services in the two cases. The witness further agreed with Mr. Collin that a "simple siding" could not be defined—that it is a term "foreign to railroad operation."

C. H. Burgess, representing the Youngstown Chamber of Commerce, brought out the fact that many solid trains of coal for single Youngstown plants are handled by the P. & L. E. Mr. O'Toole agreed that these involved less work than would trains of mixed freight. In normal times, he continued, service at the larger plants of Youngstown involves the handling of from 14,000 to 18,000 loaded cars per month; these plants, he added, are now operating at about 35 per cent of capacity but it is not possible to reduce switching services proportionately.

Mr. Sladden was at this point recalled to explain to Director Bartel certain items in P. & L. E. tariffs, after which the presentation of that road was concluded. Mr. Healy agreed to file within 10 days a schedule, listing lessees of P. & L. E. property, the terms of the leases involved and, if possible, indicate the purposes for which the leased property is used.

P. & W. V.—A. C. & Y.

The Pittsburgh & West Virginia presented two witnesses—R. M. Paisley, general freight agent, and C. O. Dambach, superintendent. Mr. Paisley cited for the record all P. & W. V. tariffs covering switching absorptions, allowances and other terminal services. Much of the time Mr. Paisley was on the stand was consumed in arguments of counsel on the question of switching absorptions and what if anything the annual total of these, which Attorney Hagerty requested, would mean.

It developed that the P. & W. V. has no industries local to its line in Pittsburgh and thus what traffic it enjoys in and out of that city is handled under absorption tariffs. It was finally agreed that the P. & W. V. would supply the absorption figure to Mr. Hagerty for decision as to what use, if any, would be made of it. Mr. Paisley's observation on the question was that revenue from all traffic handled under switching absorption tariffs should be removed from the gross revenue figure before any attempt was made to deduct payments to switching lines; if the P. & W. V. did not make the absorptions, he explained, it would not have the same gross revenue.

Mr. Dambach revealed that only one large steel plant is served directly by the P. & W. V. tracks—all others are reached through switching arrangements with connecting lines. He explained briefly interchange and spotting services performed. This witness was not cross-examined by Attorney Hagerty but was questioned by Director Bartel on the interchange which the P. & W. V. has with the Monessen & South Western, serving the Pittsburgh Steel Company, the Pittsburgh Steel Products Company and the National Steel Fabric Company.

The director asked Mr. Dambach if the P. & W. V. could physically perform the services for which it now grants the Monessen & South Western an allowance. The witness first said that it could not unless it acquired a new locomotive capable of negotiating the M. & S. W. tracks; he later said that the P. & W. V. had such a locomotive at another point which could be reassigned. Asked if the M. & S. W. would permit the P. & W. V. to perform the spotting Mr. Dambach replied in the negative, adding that such an arrangement would interfere with the plant operations.

S. J. Witt, traffic manager, was the only witness appearing for the Akron, Canton & Youngstown. This road has no industrial common carrier connections; neither does it grant allowances to any industries. It follows the standard diversion and reconsignment rules and in no instance loads or unloads carload freight. Its trap car rules, however, have not been standard in one respect, as Mr. Witt explained. No minimum weight is required for trap car services from industries on the A. C. & Y. line. This was done at the outset, the witness stated, because some industries were located in outlying districts with unpaved roads; thus drayage was difficult. When this situation was changed the truck competition entered the picture so the waiving of the minimum was continued in an effort to meet such competition. It has not been successful in this respect, he added.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading continues to fall farther and farther behind the figures of last year and the year before. For the week ended September 26 the total was 738,029 cars, a decrease of 4,599 cars as compared with the week before and of 212,634 cars, or over 22 per cent, as compared with the corresponding week of last year. As compared with 1929 the decrease was 465,110 cars, or over 38 per cent. Loading of livestock, coal and coke showed increases as compared with the week before but other commodity classifications showed reductions, and all of them showed large decreases as compared with previous years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, September 26, 1931

Districts	1931	1930	1929
Eastern	163,636	204,151	217,280
Allegheny	142,880	184,606	241,637
Pocahontas	48,199	57,004	68,361
Southern	104,192	130,936	157,503
Northwestern	100,286	144,085	182,023
Central Western	115,517	148,295	179,037
Southwestern	63,319	81,586	103,298
Total Western Districts	279,122	373,966	464,358
Total All Roads	738,029	950,663	1,203,139
Commodities			
Grain and Grain Products	36,983	43,070	49,049
Live Stock	25,195	29,068	35,000
Coal	128,723	153,159	211,001
Coke	4,715	7,951	12,422
Forest Products	25,535	42,159	63,781
Ore	25,806	48,095	68,857
Mdse. L.C.L.	216,819	244,759	273,494
Miscellaneous	274,253	382,402	489,535
September 26	738,029	950,663	1,203,139
September 19	742,628	952,561	1,167,395
September 12	667,750	965,813	1,153,274
September 5	759,546	856,649	1,018,481
August 29	763,764	984,510	1,162,100
Cumulative total, 39 weeks	28,565,988	35,153,796	39,920,026

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended September 26 totaled 50,325 cars, a decrease from the previous week of 3,469 cars and a decrease from the same week last year of 20,481 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
September 26, 1931	50,325	21,724
September 19, 1931	53,794	22,309
September 12, 1931	50,054	20,160
September 27, 1930	70,806	30,808
Cumulative Totals for Canada		
September 26, 1931	1,886,161	1,007,452
September 27, 1930	2,378,200	1,306,308
September 28, 1929	2,659,738	1,609,888

Freight Car vs. Motor Truck*

Comparative shipping costs between New York and Philadelphia analyzed—Disadvantages of truck transport—Container service available

By Russell W. Talbot

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IN order to reach some definite conclusions as to the role which comparative shipping costs play in the total situation, a detailed analysis was made of this factor for each of the 15 cases investigated. These analyses are presented in Table II. The direct comparison in Table II of the cost of shipping by motor truck with the total cost of shipping by rail is supplemented by various descriptive facts.

The trucking rates are given as they were obtained from the shippers, either in definite figures or in a comparison when the shipper did not care to divulge his exact trucking rate. These rates cover the through movement from shipper's plant to consignee's store door by one transportation agency.

In order to afford a true basis for comparison, the total cost of shipping via rail was compiled with reference to the particular conditions which existed in the business of the shipper concerned. This cost was figured either on a carload or less-than-carload basis, according to the class of traffic which predominated for each shipper in the area under investigation. This distinction was not especially difficult to make, as most of the products moved in one class or the other.

Bases of Rail Costs

If the movement was on a carload basis to the sidings of the consignees, the total shipping cost via rail was, of course, equal to the rail carload class rate plus any necessary local switching charges. Class rates are used because the traffic under consideration was largely merchandise and did not move under commodity rates. The total cost was equal to the carload class rate plus the cost of local cartage at the delivery end of the rail haul, if there were carload shipments to consignees without rail sidings. (The local cartage rate was figured on a truckload basis.) If the shipments were less-than-carload, the cost of local cartage on both ends of the rail haul was added to the less-than-carload rail rate. In many cases the shipper kept no figures of the cost of operating his own trucks, so the average cost of the local cartage from his plant to the freight station could not be determined. Practically all shippers maintain their own fleet of trucks for this work. In these cases the local cartage rate in Philadelphia was

* The second excerpt from a survey entitled "The Shipping Situation between New York City and Philadelphia," privately printed for the Committee on Transportation, Yale university. The first excerpt appeared in the *Railway Age* of Sept. 26.

Table II—Analysis of Comparative Shipping Costs

Case No.	Names of products	Does shipper pay trucking charges?	Mainly CL or LCL shipments in area	LCL rail rates	CL rail rates	N. Y. City local cartage rate	Philadelphia local cartage rate	Trucking rate	Total cost of shipping via rail	On CL or LCL basis	Saving by motor truck shipment
1	Paper	Pay CL rate only	LCL	22.5	18.5	13.0	9.0*	27.0	44.5	LCL	17.5
2	Cardboards	Yes	LCL	28.5	18.5	40.0	27.0*	40.0	95.5	LCL	55.5
2	Photo-mounts	Yes	LCL	41.5	...	40.0	27.0*	40.0	109.0		68.5
3	Paper box flats	FOB only	LCL	28.5	19.5	10.0	6.0	50.0	44.5	LCL	loss 5.5
4	Woolen cloth	Yes	LCL	41.5	...	25.0	17.0*	70.0	83.5	LCL	13.5
5	Velvet	Yes	CL	?	41.5	25.0	17.0*	100.0	66.5†	CL	loss 33.5
6	Raw chemicals	Yes	LCL	Various	Various	Various	Various	Same as LCL rail	LCL + local cartage	LCL	Save local cartage
7	Raw chemicals	Yes	CL	34.0	22.5	17.0*	11.5	Same as CL rail	27.5‡	CL	5.0
7	Technical chemicals	Yes	LCL	41.5	28.5	17.0*	11.5	CL † Phila., cartage	70.0	LCL	30.0
8	Conductor pipe	Yes	LCL	34.0	23.0	20.0	13.0*	45.0	67.0	LCL	22.0
8	Steel windows	Yes	LCL	34.0	19.5	20.0	13.0*	45.0	67.0	LCL	22.0
8	Steel shelving	Yes	LCL	28.5	19.5	20.0	13.0*	45.0	61.5	LCL	16.5
9	Steel filing cabinets	FOB only	LCL	34.0	...	30.0	20.0*	125.0	84.0	LCL	loss 41.0
10	Linoleum	Yes	LCL	34.0	22.5	10.0	7.0*	CL† N. Y. & Phila. cartage	51.0	LCL	11.5
11	Radio sets	FOB only	LCL	41.5	28.5	20.0	13.0*	62.0	74.5	LCL	11.5
12	Hard candy	Yes	LCL	34.0	28.5	10.0	7.0*	50.0	51.0	LCL	12.5
13	Crackers	FOB only	CL	...	22.5	...	...	CL† N. Y. & Phila. cartage	CL† ‡ N. Y. cartage	CL	1.0 loss. am't of Phila. cartage
14	Paint	FOB	LCL	28.5	19.5	23.0*	15.0	50.0	66.5	LCL	16.5
14	Calcimine	FOB	LCL	22.5	19.5	23.0*	15.0	50.0	60.5	LCL	10.5
15	Cigars	Yes	LCL	41.5	34.0	10.0	7.0*	50.0	58.5	LCL	8.5
15	Raw tobacco	Yes	CL	41.5	22.5	10.0	7.0*	35.0	29.5†	CL	loss 5.5

* Estimated on the basis of Philadelphia cartage being two-thirds of New York City cartage.
† Consignee having no rail connection, local cartage charge at delivery end must be included.
‡ Philadelphia switching rate of five cents per cwt. included.

assumed to be two-thirds of the corresponding rate in New York, this being the ratio indicated by such comparative figures as were obtained.

Any miscellaneous cost items, such as those due to differences in packing requirements or in the cost of loading or unloading, were not taken into consideration because of insufficient data. In a large number of industries, the miscellaneous costs are essentially the same for both means of transportation, so the analysis of the comparative shipping costs was simplified by excluding the miscellaneous costs.

A study of Table II will show that all the industries which consider shipping cost to have an important influence on their choice of motor truck transportation have two features in common. They all pay the trucking charges on shipments in this area and they all have a trucking rate which is appreciably lower than the cost of shipping via rail. Hence, their use of motor truck transportation instead of rail results in substantial savings to them, which would be reflected in a larger profit to the shipper or a lower price to the consumer, if the latter were necessary to meet competition. It should be pointed out here that most companies cannot arbitrarily assume or not assume the cost of shipping their products to given sections of the country, but have to be governed largely by the prevailing practices of their companies in the industry.

Why Cost Is Not a Factor

Table II indicates that those concerns which do not consider shipping cost to be a factor in their choice of truck transportation can be classified in two groups on the basis of comparative shipping costs.

One group is comprised of those for whom the cost of shipping by motor truck is definitely more than the corresponding cost of shipping by rail. In three of these cases the shippers do not pay the trucking charges but pass them on to the consignees. The consignees are apparently willing to pay this extra cost of shipping by motor truck, because they consider the service factors valuable. In these cases the shipper would have no direct reason for rejecting motor trucking because of higher shipping cost, unless objections were made by the consignees. In the other cases of this group the shipper himself is apparently willing to pay the higher shipping cost because of similar compensating factors.

The other group is comprised of those concerns to whom the cost of shipping by motor truck is less than the corresponding rail cost. That the shippers in this group do not consider shipping cost a factor of any consequence in their choice of truck transportation is accounted for as follows:

1—The shippers do not pay the transportation charges and hence are not directly benefited by any saving.

2—The saving in shipping cost is small in comparison with the value of the product, and therefore the saving is not considered of consequence.

3—The shippers do not maintain accurate records of local cartage costs and consequently do not know whether they are actually saving money in shipping by truck.

Disadvantages of Motor Truck Transportation

It will be remembered that the purpose of making this survey was to establish the requirements for a co-ordinated rail and motor truck transportation system which would render more satisfactory service than is given by any other system at present in the intercity haulage of freight. Therefore, it is desirable to describe some of the disadvantages of present-day motor trucking, in order to present a well-rounded picture for use as a background.

The most serious drawbacks to motor truck transportation result from the fact that there are many small trucking companies rather than a few large ones operating in this field in very keen competition. It is more or less common knowledge among the shippers that this competition has led to unethical practices on the part of some of the truckers.

Some truckers are reputed to have a lucrative business in hauling liquor between Philadelphia and New York, at the same time carrying partial loads of legitimate commodities as a blind. Such truckers offer very cheap rates to shippers in order to secure their business, and make their profit on liquor. If a truck happens to be confiscated by the police, it results in the loss of legitimate goods by the shipper and undue notoriety. This has made most shippers very cautious as to the trucking companies with which they contract for transportation.

In some companies, the shipping clerks have agreements with certain truckers to do everything possible to prevent other truckers from getting the business of their companies. When a shipper purchases from companies in which this practice has developed, he is forced to deal with one of the accepted truckers in order to obtain the requisite service.

In some cases shippers are obliged to carry their own transportation insurance to protect against loss or damage to their products moving by motor truck. Where the products are of an expensive nature, the loss due to the destruction of an entire truckload is large and the insurance carried by the trucking company is often not adequate to cover the loss. A few large trucking companies would be able to provide adequate insurance.

The above-mentioned drawbacks, together with the fact that the cost of shipping certain articles by motor truck is greater than by rail, are the main existing disadvantages of motor truck over rail transportation that were indicated by this survey.

Container Car Service in This Area

Container car service was established by the Pennsylvania in 1928 from New York and South Kearny, N. J., to Philadelphia. This system represents the first attempt by the railroads in the area under consideration to establish a co-ordinated rail and motor truck service for providing a new method of handling less-than-carload freight shipments. This was done with a view to putting back on the rails the long haul portion of this intercity freight movement which has been largely lost to the trucking companies, as is demonstrated by the fact that the intercity movement of freight analyzed in this study is almost entirely by motor truck transportation.

A brief description of container car service is embodied in the following extract from a booklet issued by the Pennsylvania on this subject.

The container service, as its name implies, is a form of transportation particularly adapted to the carriage of goods in less-than-carload quantities, whereby the articles to be transported are placed in steel containers which are securely fastened on flat cars or loaded into gondola cars and so moved from point of origin to destination. The containers are so constructed that they can be transported upon specially-equipped railroad cars as well as upon motor trucks and trailers.

Container service has not achieved the success that its sponsors hoped for and at present is being used mainly for the transport of a few special commodities, such as magazines, cigars, cement, and sand, and of consolidated small lot shipments from freight forwarding companies. The following seem to be the more important reasons why this service has not been more widely adopted.

1—Container service does not provide overnight delivery

and the flexible service features given by motor truck transportation in the intercity movement of freight.

2—The limited size of containers prevents their use for products whose dimensions are not adapted to the dimensions of the container. (Outside dimensions are 7 ft. wide, 9 ft. long, and 8 ft. high.)

3—Some concerns do not use containers because their shipments to any given consignee are not large enough to load the containers to advantage.

4—Some shippers do not use container service because they find it more expensive than motor truck transportation. They are able to ship the amount of their product which they can load into one container for less by truck than the combined cost of the minimum charge per container, which is $8.25, plus the cost of the local haulage of the container.

Highway Transport Enjoys Heavy Subsidy in Canada

MOTOR truck and bus competition with the Canadian railways have received much attention recently in various parts of Canada. T. E. McDonnell, president and general manager of the Canadian Pacific Express Company, addressed the Calgary Board of Trade on this subject, while S. W. Fairweather, of the bureau of economics of the Canadian National spoke to the Canadian Good Roads Convention at Lucerne, Que.

Mr. McDonnell, at Calgary, spoke, in part, as follows:

"I know there have been published so-called statistics indicating contributions toward highway construction and maintenance made by the operators of highway transport, and in all those which I have seen I find a violent assumption which to me destroys their probability; that is, they claim credit for registration fees and gasoline taxes paid, not only by private passenger cars, but also those fees and gasoline taxes paid by the thousands of motor trucks operated wholly within municipalities for delivery service and which, generally speaking, never use the provincial highways."

Levies on Commercial Highway Users Far Too Low

"The nearest thing to reliable information known to me," continued Mr. McDonnell, "relates the experience of one Government during the year 1930, which indicated that the vehicles actually engaged in highway transport service for hire contributed in fees less than one-half of one per cent of the money expended in that year on its highways.

"This represents the existing situation as to highway transport competition as I have found it after careful investigation. We know definitely that highway transport operators have made serious inroads on rail traffic and we believe they have been able to do this not because the costs are less than rail costs, but because under existing conditions highway transport operators have part of their costs paid by general taxes. We have also found that highway transport truck operators are permitted to and do make curbstone deals for traffic which destroys all stability of transportation charges, permits secret and discriminatory rates as between shippers, with the usual result that most shippers are suspicious that their competitors in business are able to secure more favorable rates than themselves."

Investigation into the bus and truck business of the province was asked in Calgary last week by employees of the Canadian Pacific in a conference with Hon. Vernon Smith, Minister of Railway and Telephone.

The delegation, composed of men who were made jobless through closing of the railway shops here last week, urged that the province tax the motor truck and bus business and, in co-operation with the federal government, subject the highway passenger and freight traffic to regulations similar to those under which railways operate. A survey to bring about more equitable basis of competition between the two means of transportation was requested.

"There is considerable reason in the plea of these men and I told them that the matter would be given every consideration," said Mr. Smith at the close of the conference. "The provincial government will welcome any suggestions along this line that may be submitted."

Canada has invested in highway systems over $900,000,000 and is adding to that investment at the rate of $55,000,000 per year but is collecting highway revenue only to the extent of $41,000,000 per year. These figures were presented to the Canadian Good Roads Association meeting at Lucerne, Que., last week by S. W. Fairweather, head of the bureau of economics of the Canadian National, who warned the country against plunging too deeply into highway expenditures without making adequate plans for a fair return on the investment.

Highway System Operating at Deficit

Mr. Fairweather estimated that the cost of maintaining the present highway system and taking care of the interest and depreciation on the capital cost would amount to at least $133,000,000 yearly.

Agreeing with a suggestion advanced by S. L. Squire, Toronto, chairman of the executive committee of the Canadian Good Roads Association, that urban centers should be called upon to pay a larger share of the highway taxation, Mr. Fairweather felt that such action would fall far short of meeting the situation. From an engineering and financial standpoint the principles of taxation should be based, he thought, on "the occupation or potential use of the highway, destruction of the highway, and commercialization of the highway." The measure of the first would be the number of vehicles in use, the measure of the second the gross weight of the vehicles, and the measure of the third, on economic grounds, the rental value of the highway.

Private Motorists' Tax Too High

Mr. Fairweather believed the license fees on private cars too high and therefore the first principle had been over exploited. The second principle, dealt with by the gasoline tax and graduated license fees according to car weights had been under-exploited, he believed. He saw possibility of a gasoline tax of 10 cents a gallon and registration fees on heavy transport trucks as high as $500. The third principle had been almost neglected as a source of revenue, said Mr. Fairweather. That concerned the charges upon companies operating express and passenger routes on the highways.

"Monopoly rights for buses have been granted with no compensation; rights so valuable that there is a record of one franchise with no other tangible assets being transferred between private parties at a figure of $4,000 per route mile," declared Mr. Fairweather. "If the bare franchise had that value why should not that value accrue to the state which created the monopoly rights?" he asked. "Even where monopoly is not granted, the commercialization of the highway should be upon a business basis, paying a reasonable fee for the use of the capital invested in the highway and used for private gain."

Odds and Ends . . .

A Model Signal

As an aid in instructing train service employees in the rules governing train operation, W. B. Kimball, train dispatcher of the Columbus division of the Pennsylvania, has constructed a model position-light signal that is capable of displaying the 16 different position-light signals that are in use on the Columbus division. Small electric lights indicate the signal positions. The various aspects are displayed by turning a knob which operates the contacts between the battery and the various lights. The model is self-contained and easily operated.

A Foreman at Fifteen

In the contest to determine the youngest age at which any man has attained a supervisory position on a railroad—a contest which we have just thought up and which we now declare to be under way—J. L. Lavallee, assistant manager of the railway sales division of the Texas Company, proposes the name of William Newburg, who is now general foreman on the Michigan Central at Chicago. Mr. Newburg was night roundhouse foreman of the Chicago & West Michigan railroad at New Buffalo, Mich., when he was only 15 years old. Can anyone equal or even approach this record?

Our Weekly Nest-Building Story

Instances of birds building nests on railway trains and other railway property are not confined to the western hemisphere. We are informed that the "Rheingold," the fast German train which traverses the Rhine valley, now includes among its regular passengers three young redstarts. When a baggage coach which had stood on a siding for some time in Basle was placed in service, it was found that a pair of redstarts had built a nest on it and hatched three tiny birds. The parent birds deserted the nest when the trip began, but the crew of the train have fed the fledglings with hard-boiled eggs on several trips between Amsterdam and Lucerne, and the youngsters are now about ready to fly.

The Katy "Zoo"

What is believed to be the only "petrified zoo" in captivity is to be found adjacent to the Missouri-Kansas-Texas station at Hiattville, Kan. Here J. R. Smith, Katy section foreman, has created, out of a miscellaneous collection of stones picked up along the right of way and at a nearby quarry, a most interesting collection of animals, birds, lizards, and what not. The stones apparently are natural rock formations, which a touch of paint here and there has transformed into surprising likenesses of beasts, birds and fishes. Included in the menagerie are bears, elephants, sheep, dogs, an ant-eater, chickens, turtles, lions, lizards, pelicans, seals and rabbits. Smith has plenty of rocks on hand, but he is beginning to worry about running out of animal subjects.

The Perennial Pass Problem

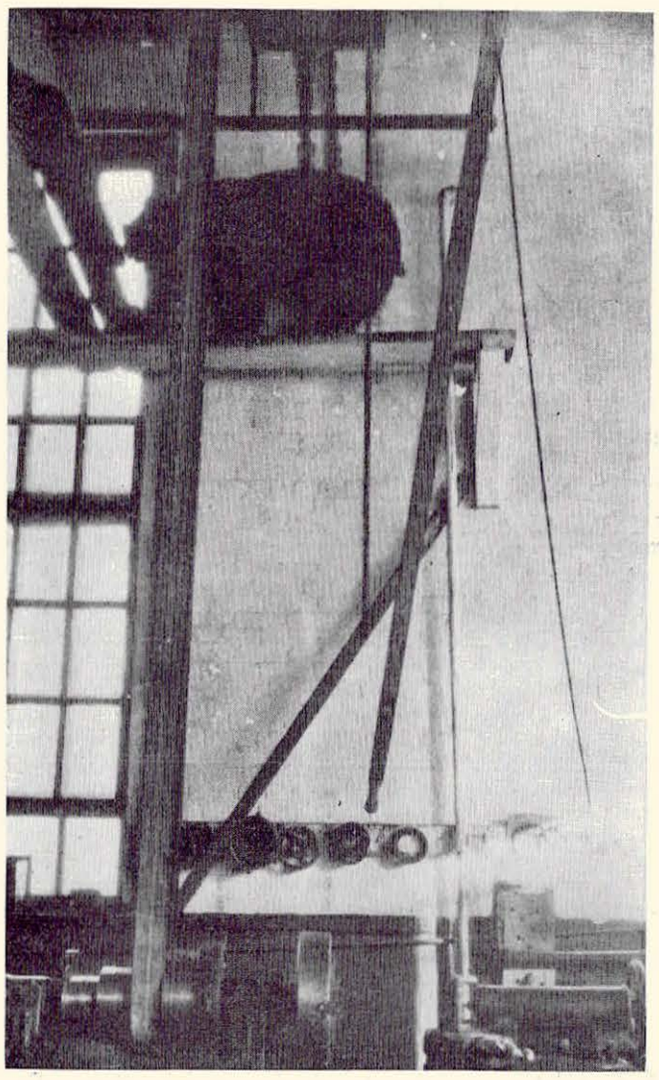
Those who are currently wrestling with the question of who shall be given railroad passes and who will have to pay their fares—or resort to hitch-hiking—may be comforted by the knowledge that their predecessors had the same trouble in the old days. We have just received a copy of a circular on the subject of passes which reports the action taken by the Western Railway Managers at a meeting held in Chicago on December 28, 1878—53 years ago. These managers signed the following agreement:

"That no free passes shall be given to shippers of freight, their agents or representatives, after January 1, 1879, nor shall any form of ticket be sold or disposed of at less than regular tariff rates for the purpose or with the intent of influencing competitive freight or passenger traffic, it being agreed that the minimum rate for one-thousand-mile tickets shall be three cents per mile; that the parties hereto will withdraw all books or forms of blank passes in the hands of their own or the agents of any other company; that any violation of this agreement shall be communicated to the secretary of this meeting, and, before any party hereto shall violate the conditions herein prescribed, he shall await the action of a meeting of all parties in interest."

Among those who attended the meeting and signed the agreement were Marvin Hughitt, general manager of the Chicago & North Western; J. F. Tucker, traffic manager of the Illinois Central; S. S. Merrill, general manager of the Chicago, Milwaukee & St. Paul; C. W. Smith, traffic manager of the Chicago, Burlington & Quincy; Hugh Riddle, president of the Chicago, Rock Island & Pacific, and J. C. McMullin, general manager of the Chicago & Alton.

A Bear for Railroading

Through the courtesy of C. E. Brooks, chief of motive power of the Canadian National, we are able to show the reason why the foreman and employees in the Jasper, Alberta, machine shop were on their toes one day recently. The reason was a bear which found his way into the machine shop and chose a shelf as a vantage point from which to observe the maintenance operations of the roundhouse forces. He may have been looking for work, but Mr. Brooks assures us that the bear was not even put on the extra list.



The Jasper Machine Shop Bear

NEWS

Net Return Further Reduced in August

Net income down to 1.90 per cent; eight months' return 1.31 per cent below 1930

Class I railroads for the first eight months of 1931 had a net railway operating income of $350,943,778, which was at the annual rate of return of 2.14 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first eight months of 1930, their net was $556,466,261, or 3.45 per cent. For seven months of this year the net was 2.19 per cent. Operating revenues for the eight months totaled $2,929,108,894, compared with $3,615,795,956 for the same period in 1930, or a decrease of 19 per cent; operating expenses were $2,266,364,952, a decrease of 17.1 per cent.

Taxes for eight months totaled $221,626,833, compared with $243,817,704 for the same period in 1930, a decrease of 9.1 per cent. For August alone, the tax bill amounted to $28,081,883, a decrease of $4,103,535 under August, 1930.

Thirty-five Class I railroads operated at a loss in the first eight months of 1931, of which 12 were in the Eastern district, 6 in the Southern and 17 in the Western.

August net earnings were $55,858,734, or at the rate of 1.90 per cent. In August, 1930, the net was 3.33 per cent. Operating revenues for August amounted to $364,525,038, a decrease of 21.8 per cent; operating expenses were $269,463,438, a decrease of 17.7 per cent.

The Eastern district reports for eight months a net of $186,270,906, or at the rate of 2.33 per cent. For the same period in 1930, the net was 3.92 per cent. Operating revenues for eight months were $1,465,874,152, a decrease of 19.3 per cent; operating expenses, $1,130,705,649, a decrease of 16.7 per cent. Net income for August alone was $25,645,123, compared with $44,581,813 in August, 1930.

In the Southern district reports for eight months show a net of $31,760,674, or at the rate of 1.49 per cent; for the same period in 1930, the net was 2.56 per cent. Operating revenues for eight months amounted to $364,842,534, a decrease of 17.4 per cent; operating expenses, $297,429,988, a decrease of 15.3 per cent. Net for August totaled $3,431,432, compared with $5,848,823 in August 1930.

The Western district reports for eight months a net of $132,912,198, or at the rate of 2.11 per cent. For eight months in 1930, it was 3.17 per cent. Operating revenues totaled $1,098,392,208, a decrease of 19 per cent; operating expenses, $838,229,315, a decrease of 18.2 per cent. For August, the net amounted to $26,782,179; in August, 1930, it was $45,587,038.

Dunn and Lee Head Simmons-Boardman Co.

Railway Age editor and business chief elected to executive posts in publishing firm

Directors of the subsidiary companies controlled by the Simmons-Boardman Publishing Corporation, on October 7, elected the following executive officers: Simmons-Boardman Publishing Company, Samuel O. Dunn, chairman of the board, and Henry Lee, president; American Builder Publishing Corporation, Henry Lee, chairman of the board, and Samuel O. Dunn, president. These executive positions were held by the late Col. Edward A. Simmons. Out of respect to the memory of the late chief executive, the chairmanship and presidency of the Simmons-Boardman Publishing Corporation, the holding company controlling the operating subsidiaries, were not filled at this time.

Heretofore Mr. Lee has served the Simmons-Boardman companies as vice-president in charge of its business department, while Mr. Dunn has been vice-president and editor-in-chief of the *Railway Age* and its other publications. Mr. Lee's headquarters will remain at 30 Church street, New York, as at present, while those of Mr. Dunn will continue to be in Chicago, at 105 West Adams street. An account of their careers with the *Railway Age* and its affiliated publications will appear in next week's issue.

Lighting Institute at New York

The Westinghouse Lighting Institute, Grand Central Palace, New York, has been acquired by the Electrical Association of New York, effective October 1, 1931. The Westinghouse Lamp Company contributed the Institute to the Electrical Association without cost, and the Institute will hereafter be maintained and operated as an industrial, educational and market development center by the association. Ralph Neumuller, former director of the Westinghouse Lighting Institute, will assume the managing directorship of the Electrical Association, supervising both its market development and the institute activities.

I. C. C. to Disapprove of Joint Directorships

Interlocking of directors between independent systems banned under new ruling

A ruling indicating an intention to disapprove hereafter interlocking directorships between independent railroad systems such as are contemplated in the consolidation program was announced on October 6 by the Interstate Commerce Commission in denying an application filed by Frank C. Rand, of St. Louis, for authority to hold the position of director of the St. Louis-San Francisco while continuing to hold the position of director of the Cleveland, Cincinnati, Chicago & St. Louis.

Calling attention to language used in its consolidation plan report of December, 9, 1929, in which it said the systems therein proposed must be independent in fact as well as in name, in order that competition may be preserved as required by the law, Division 4 also points out, in this report on Mr. Rand's application, that the Big Four under the consolidation plan is a part of the New York Central System, No. 3, and that the Frisco is a part of the Rock Island System, No. 19, and says: "Actual independence of the systems concerned will not be subserved by permitting the same persons to serve upon the boards of directors of two major carriers, each of which is an important member of a different independent system."

"While the foregoing extract from our report relates particularly to systems serving the same territory and therefore being in direct competition as usually defined, we are of the opinion that public interest will be served in greatest measure if complete independence and impartiality can be secured and maintained between systems generally, although directly serving different territories. Under our proposed consolidation plan, the eastern trunk-line systems will connect and interchange traffic at Chicago, Omaha, Kansas City, and St. Louis with other systems directly serving the Northwest, the West, and the Southwest. In many cases the systems will have the election between two or more connecting systems for the routing of traffic. The act specifically requires that carriers establish and maintain nondiscriminatory facilities and practices in the matter of traffic interchange with their connections, and it seems apparent that the performance of this obligation will be best in-

sured by the preservation of the independence of each system."

This indicates that the commission does not intend to authorize men to serve on the boards of western systems, such as the Rock Island, who, because they are also directors of parts of the New York Central system, might be assumed to be inclined to promote the interchange of traffic with the New York Central lines in preference to other eastern lines, or vice versa. If this principle is carried out there are likely to be many resignations of directors now serving on eastern roads and at the same time on the boards of western or southern roads.

This issue was avoided last year after the Van Sweringen interests had acquired control of the Missouri Pacific and in May elected eight of their representatives to the Missouri Pacific board, including O. P. Van Sweringen, who had been chairman of the Chesapeake & Ohio and the Pere Marquette. All of the eight promptly resigned from any offices or directorships they had held with the eastern roads of the Van Sweringen properties.

N. I. T. League

The annual meeting of the National Industrial Traffic League will be held at the Palmer House, Chicago, on November 18 and 19. The meeting of the executive committee will be held on November 16 and 17.

Joint Claim Conference Meetings

A joint meeting of the Eastern and Chicago claim conferences will be held at Buffalo, N. Y., on October 28, and of the Southeastern and Southwestern claim conferences at New Orleans, La., on November 4, to discuss uniform settlements and claim prevention.

Wage Statistics for July

Class I railways reported to the Interstate Commerce Commission a total of 1,309,793 employees as of the middle of July, a decrease of 221,918, or 14.49 per cent, as compared with the number in July, 1930. The total compensation was $183,864,067, a decrease of 15.61 per cent.

Club Meeting

The Car Foremen's Association of Chicago will hold its next meeting on Monday evening, October 12, at the Auditorium Hotel, Chicago. Captain John W. Gorby, in charge of railroad and marine exhibits at the Century of Progress Exposition, will speak on "The Railroads' Participation in a Century of Progress."

Illinois Coal Rates

Increases in intrastate freight rates on coal between certain points in Illinois, ordered by the Illinois Commerce Commission on a basis lower than that prescribed by the Interstate Commerce Commission, are recommended by Examiner R. N. Trezise in a proposed report to the Interstate Commerce Commission made public on October 6. He recommends a finding that these rates ordered by the state commission be found unreasonable and discriminatory; also a finding that the rates from points in Illinois over interstate routes to Chicago are not unreasonable; but proposes readjustment of rates from Indiana, Illinois and western Kentucky to Moline, Rock Island and related points in Illinois.

Freight Claim Prevention Committee Organized

The Atlantic States Shippers' Advisory Board, at its meeting in Philadelphia on October 1, organized a committee on Freight Claim Prevention, the chairman to be C. L. Hilleary, traffic manager of the F. W. Woolworth Company, New York.

Western Livestock Rates Postponed

On petition of the western and southwestern railroads the Interstate Commerce Commission has postponed from October 27 to January 25 the effective date of its order prescribing a general revision of western livestock rates. The roads said it was physically impossible to complete the work of tariff publication by the date set.

Mexican Railways Contemplate Bus Operation

According to the reports from Monterey, Mexico, the National of Mexico is considering the establishment of several motor bus lines. Surveys have been made covering routes in Northern Mexico, following railway lines between Monterey and Laredo, Monterey and Tampico, Saltillo and Torreon, and Eagle Pass and Torreon. Similar surveys are being made of proposed routes radiating from Mexico City.

Court Asked to Expedite Grain Case

All parties involved in the western grain rate case jointly submitted to the Supreme Court of the United States on October 3 a motion to advance the case for early hearing. This is an appeal by the western railroads from a decision of the federal court at Chicago denying an injunction to restrain the enforcement of the order of the Interstate Commerce Commission prescribing a general revision of western grain rates, which the carriers said would reduce their revenues about $20,000,000 a year.

Pullman Exhibit Attracts Attention

That the Pullman Company's exhibit of sleeping-car accommodations at Chicago is attracting considerable attention is evidenced by the fact that on September 26 a total of 1,450 persons visited the showroom. Since the day of the opening, March 28, when the display consisted of a single-occupancy section, as described in the *Railway Age* of April 11, page 736, more than 29,000 persons have visited the exhibition. The showroom was closed for alterations early in August, and reopened with three principal exhibits, a single-occupancy section, a private section and a double bedroom, as well as a section equipped with four-position seats and other accommodations. From August 21 to September 26, inclusive, 22,598 persons have listened to descriptions of the exhibit and have asked questions about service and rates.

P. R. R. to Abandon Electric Operation into Atlantic City

The Pennsylvania will abandon its third rail electric system between Atlantic City, N. J., and Newfield replacing the electric system, which has been in operation for 25 years, by gas-electric cars and steam trains. The necessity of reducing operating expenses over the line which connects Atlantic City with Camden, N. J., via Newfield, was assigned as the reason for the change. The third rail system will remain in effect between Millville, N. J., and Newfield.

Boston-Maine Airways Closes Successful Season

More than 2,000 persons flew on the lines of the Boston-Maine Airways, Inc., during the two months' season which closed on September 30.

Starting on August 1 this air auxiliary of the Boston & Maine and the Maine Central, in co-operation with Pan American Airways Company, in its first season flew approximately 40,000 miles in an intensive daily service between Boston, Mass., and Portland, Me., Rockland, and Bangor. Operation of the line, which was the first passenger air service wholly sponsored by railroads in this country, was successful and the railroads are now making a detailed study of operating costs, traffic carried, and potential air traffic in the territory served, with the present intention of resuming operation in the spring.

Patents Meeting Postponed

Owing to unexpected developments, it has been necessary to postpone the subject, Patents and Railway Progress, scheduled to be presented by Charles L. Howard, assistant general counsel of the Western Railway Association, before the October meeting of the Western Railway Club, until November. The meeting, which will be held Monday evening, October 19, at the Hotel Sherman, Chicago, will be devoted to new developments in the air conditioning of passenger cars. A representative of the Carrier Engineering Corporation will describe the new steam ejector system, developed by this company, illustrating his talk with lantern slides. Representatives of the York Ice Machinery Corporation, York, Pa., and of other manufacturers of air-conditioning apparatus will also be present to describe the latest improvements in their respective equipments.

Freight Service Out of St. Louis Speeded Up

The Missouri Pacific and the St. Louis Southwestern have established new fast freight service between St. Louis, Mo., and points in the southwest. The new Missouri Pacific train, which is known as the Merchandise Special, leaves St.

Louis at 5:45 p.m. and cars arrive at Memphis, Tenn., at 5:30 a.m., at Little Rock, Ark., at 4 a.m., and Texarkana at 8 a.m. the next morning. At the same time fast freight service has been established by the Missouri Pacific between Memphis and Texarkana, cars leaving at 8:45 p.m. and arriving at 8:30 a.m. the next morning.

The new fast service of the St. Louis Southwestern, which is provided by the Blue Streak, leaves St. Louis at 5:30 p.m. and arrives in Memphis at 5:45 a.m., Little Rock at 6 a.m., Texarkana at 10:45 a.m. and Shreveport at 11:50 a.m. the next morning.

Associated Traffic Clubs Convention

The annual meeting of the Associated Traffic Clubs of America will be held at Tulsa, Okla., on October 28 and 29. The general subject for consideration will be Equalization of Regulation and Co-ordination of the Various Forms of Transportation. H. H. Rogers, president of the Exchange National Bank of Tulsa, will speak on the National Transportation Problem; H. M. Lull, executive vice-president of the Southern Pacific, on Another Phase of the Transportation Problem, and J. R. Turney, vice-president of the St. Louis Southwestern, on the Motor Industry. At the banquet on October 28, Paul Walker, chairman of the Oklahoma Corporation Commission, will speak on Pipe Line Transportation.

The special committee composed of Professor L. C. Sorrell of the University of Chicago and Professor Howard Kidd of the University of Pittsburgh, appointed to study means of developing transportation facts, will also report.

N. & W. Emphasizes Importance of Railroad Taxes

With the assertion that the railroad is more than a transportation agency, the Norfolk & Western, in a statement being published in newspapers along its line in Virginia, presents an unusual array of tax figures showing that the railroad is one of the largest payers of county and local taxes in the state.

The statement, which gives tax figures for each county served by the Norfolk & Western, reveals that railroad taxes in these counties average 18.36 per cent of, and run as high as, 37.86 per cent of the total county taxes collected. To emphasize the importance of railway taxes, the statement gives first, the total taxes collected in the county from all sources; second, the amount paid by the railroads serving the county; and third, the Norfolk & Western's share of the railroads' county tax bill. To further emphasize the significant part which the railway plays in the social and economic life of the county, the N. & W. shows just how its taxes are distributed, and gives the amounts and percentages of its taxes which are used for the operation of county and district schools, construction and maintenance of county roads, and operation of county government.

"For purely selfish reasons," the statement concludes, it is to the advantage of, and the duty of, the citizens of the county to protect the interests of the railroads "in every legitimate way possible."

Mid-West Shippers' Board

Commodity committee reports submitted at the meeting of the Mid-West Shippers' Advisory Board at Chicago on October 1 indicate that car loadings in that territory for the fourth quarter of 1931 will be 11.5 per cent less than in the same quarter last year. The commodities which are expected to show increases are grain, 10 per cent; fresh fruits, 50 per cent; potatoes, 20 per cent; livestock, 5 per cent, and automobiles, 20 per cent. Those which are expected to show decreases are flour, 11.2 per cent; hay, 12 per cent; fresh vegetables, 10 per cent; poultry, 5 per cent; coal, 10 per cent; ore and concentrates, 50 per cent; gravel, 35 per cent; lumber, 30 per cent; sugar, 15 per cent; machinery, 30 per cent; cement, 38.2 per cent; brick and clay products, 25 per cent; lime and plaster, 23.3 per cent; agricultural implements and vehicles, 50 per cent; fertilizers, 24 per cent; paper, 16 per cent; chemicals and explosives, 20 per cent, and canned goods, 10 per cent.

Highway Crossing Signals in New York

Proposed changes in the New York State standards for automatic electric warning signals at highway crossings were the subject of a hearing before the Public Service Commission at Albany, N. Y., on October 1. The New York Central had proposed the adoption of certain changes. The principal railroads operating in the state were represented by signal engineers or by their legal department.

The New York Central desires to have the state adopt a single design, and would add to the present regulations a rule in favor of the use of a sign reading "STOP ON RED SIGNAL." The Central also favors a rule that flashing signals should shine in both directions along the highway. Representatives of other roads spoke in favor of leaving the state authorities with discretion to decide the type of signal at any particular crossing.

The commission took various suggestions under advisement and is expected to issue an order revising the present regulations, which are those prescribed by the commission on December 3, 1925.

I. C. C. Examiner Recommends Continued Operation of New Haven Steamship Lines

Examiner John H. Howell has submitted to the Interstate Commerce Commission a proposed report recommending that the commission find that continued operation by the New York, New Haven & Hartford of its water services on Long Island Sound and elsewhere is in the interest of the public and will neither prevent nor reduce competition. The report was issued on further hearing on an investigation undertaken after a complaint had been filed by the Colonial Navigation Company. The commission had approved the service in a report dated July 10, 1918.

"New England has given unmistakable evidence," the examiner says, "that its desire is for continuing improvement and not dismemberment of that system. The degree of competition that would exist if the Sound lines were independently operated cannot be ascertained, can only be inferred." The examiner further holds that New England has stated, in effect, its belief that separation of the boat lines would result in no greater competition on the Sound than exists today.

S. P. of Mexico Labor Troubles

Charges of frequent violations of labor contracts on the part of the Southern Pacific of Mexico and complaints of reductions of salaries and personnel, are being investigated by a Board of Conciliation and Arbitration in Mexico City, in accordance with the labor law, following a vote of employees to go on strike on September 27. The calling of the strike vote was based on the following charges: 1. That the company is making money; 2. That a cut in forces of 10 per cent is unnecessary, if the company pays its foreign employees in Mexican money instead of United States currency; 3. That while foreign officers and employees are paid high salaries in gold, Mexican employees receive small salaries and in Mexican money; 4. The violation of labor contracts and of the laws of the country by employing a larger percentage of foreigners than Mexicans, and, 5. Administrative disorganization.

The Southern Pacific maintains that the money it has invested is approximately 122,000,000 pesos and that no interest has been paid on this capitalization. The losses for 1931 are now estimated to be 1,700,000 pesos more than in 1930. Because of this, economies are necessary.

At the present time, Mexicans employed by the Southern Pacific of Mexico constitute 97 per cent of the total number of employees, whereas Article 9 of the labor law specifies 90 per cent Mexicans in any concern, irrespective of the nature thereof. The same law, however, singles out railroads which must work 100 per cent Mexicans and such foreigners as may be continued in positions of direction and in technical and administrative positions where no Mexicans are available.

Canada Raises Rates on U. S. Traffic

The Board of Railway Commissioners for Canada last week at Ottawa set a surcharge rate of 10 per cent on international freight shipments and 16 per cent on passenger business. This rate will apply for the first two weeks of October. Due to the fluctuations of the Canadian dollar and its influence on international freight and passenger business, the Board set a standard rate of 16 per cent premium for New York funds.

Reverting to the practice initiated in 1921 when the Canadian dollar fluctuated for many weeks, the Board fixed the standard surcharge for freight business at 60 per cent of the pegged exchange

rate. The effect will be that, irrespective of the value of the Canadian dollar in New York, Canadian buyers of United States goods will pay 10 per cent surcharge in addition to the freight charges. The value of the goods will not enter into the transaction.

The fixed surcharge, after being collected by the Canadian railway will be divided with the United States carrier on a pre-arranged plan, mileage being one of the main factors.

The passenger surcharge will be based on the full pegged exchange rate of 16 per cent. When a ticket for a United States point is purchased at a border point, the full rate of 16 per cent will be charged. Under the board's order, a sliding scale will be operative under which the distance in Canada from the border line will determine the percentage of the surcharge.

Special Precautions Urged for Gasoline Trucks at Grade Crossings

Special precautions to safeguard the passage over railroad grade crossings of trucks loaded with gasoline and other inflammable liquids or explosives are recommended by W. P. Borland, director of the Bureau of Safety of the Interstate Commerce Commission, in a report on an investigation of a collision between a New York Central passenger train and an automobile tank truck at Richards, Ohio, on May 8. The accident resulted in the death of the two enginemen and the driver of the truck, who were sprayed with burning gasoline. The report says that during the years 1929, 1930, and the first quarter of 1931, a total of 52 such accidents was reported, although in some instances it is not clear whether the gasoline mentioned was lading or the contents of fuel tanks. While it is stated that obviously the truck driver did not definitely ascertain that the way was clear before starting across the tracks it is also noted that his view of the approaching train was almost entirely obscured by trees and box cars that stood on the passing track near the crossing.

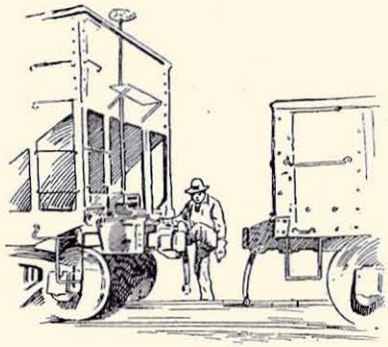
"It is not sufficient merely to 'stop, look, and listen'," the report says; "it should be definitely known that no train is closely approaching before such a vehicle is permitted to start over a crossing. In the absence of adequate grade crossing protection for all vehicles, the public interest requires that special precautions be taken to safeguard the movement of these commodities, which involve unusual and widespread dangers, and authorities responsible for supervision and control of highway traffic should give careful consideration to the necessity for requiring flag protection at grade crossings for vehicles carrying explosives and inflammable liquids. Any person, firm, or corporation using the public highways for the transportation of these dangerous articles should be required to conform with practices and regulations necessary to safeguard associated and conflicting traffic both on highways and on railroads."

Safety Section, A. R. A.

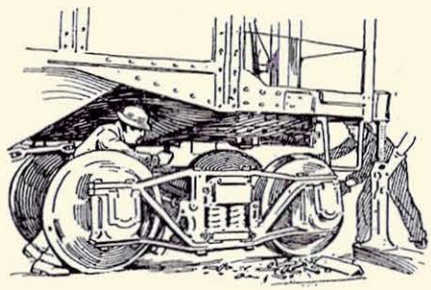
The freight conductor who gives to new brakemen the benefit of his long experience, embodying his good advice in friendly talks, is the hero of the Safety Section circular for November.

The brakeman in the story has a ten-year-old son who aims to be "a railroader like Dad;" and with this as his text the conductor preaches a sermon on how to set a good example when thus looked up to. The sermon is reinforced with admonitions based on pictures like those shown herewith and others.

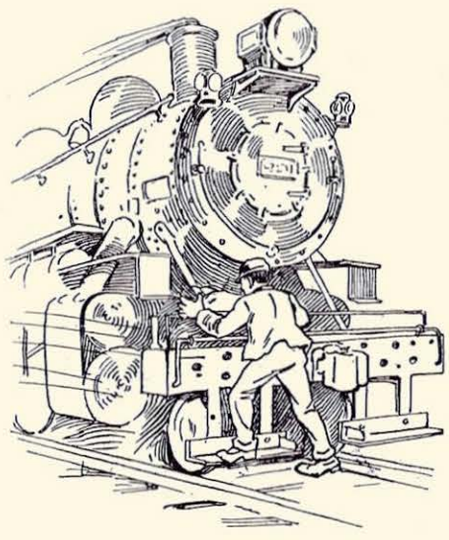
How about other lives at the mercy of your "Short Flagging?"



I saw you adjusting coupler with your foot as cars were coming together.



As a car repairer, you were an unsafe man.



Noxon Favors Constant Watch on Revenues

Frank W. Noxon, secretary of the Railway Business Association, addressing the trade associations of the paint and varnish industry at Atlantic City, N. J., on October 7, recommended constant vigilance by both shippers and railways to maintain railway revenues.

"You can deal with the problem of railway income month by month instead of waiting until the crack of doom," he said. "Nearly all the mechanism that you need is already in existence and functioning smoothly. Where do you deal with rates? Several territories have each its rate committee and each its classification committee. These docket all proposed changes. Notice to shippers and carriers is systematized. Hearings run on schedule. In these routine adjustments do shippers or railroads consider total railroad income? Not often. The primary purpose is not the protection of railway income but the adjustment of rates to business conditions.

"What I propose is a day on the docket when the primary and exclusive subject will be railway income. Perhaps the rate and classification committees of each area should sit jointly. It would be somebody's responsibility to keep looking at the income reports just as a locomotive engineer looks at his steam gage, under instruction to arrange for an income hearing whenever income falls below the danger line.

"You now have a monthly income report, by districts, from the Bureau of Railway Economics. This report tells you what the return per cent was. Per cent upon what? Upon the cost of road and equiment, the best available measure of the property value. You have the declaration of the Interstate Commerce Commission that the desirable return is 5¾ per cent. Until you get something better, why not regard 5¾ per cent as the lowest safe return in a year of good traffic?

"Under the present system, or lack of system, you read in the paper the monthly comparison of return per cent on the property with 5¾ per cent. You shake your head sadly and forget it. Under the proposed plan you would not be allowed to forget. The danger line would be

(*Continued on page 572*)

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1929.
Akron, Canton & Youngstown	August	171	$165,045	$96	$171,777	$28,691	$16,969	$10,038	$48,570	$10,294	$114,382	66.6	$57,395	$45,224	$30,263	$63,780
	8 mos.	171	1,281,321	602	1,345,248	178,111	135,785	95,389	409,131	104,612	922,375	68.6	422,873	322,464	204,325	370,143
Alton	August	1,028	1,136,610	255,110	1,538,886	259,185	305,456	71,557	644,323	46,300	1,337,684	86.9	201,202	85,395	—60,775	185,215
	8 mos.	1,028	9,572,589	2,227,071	13,142,589	1,547,584	2,628,582	564,462	5,278,237	478,257	10,585,753	80.5	2,556,836	1,616,999	371,461	432,670
Alton & Southern	August	30	.....	.....	92,594	9,510	7,690	4,934	32,953	7,149	62,236	67.21	30,358	20,438	19,298	28,395
	8 mos.	30	.....	.....	739,345	76,021	58,678	40,710	273,115	40,715	489,239	66.17	250,106	173,960	161,667	189,732
Atchison, Topeka & Santa Fe	August	9,669	11,421,398	1,721,537	14,117,383	1,401,655	2,691,125	368,973	3,904,098	404,509	8,749,249	62.0	5,368,134	3,873,189	3,883,615	4,536,405
	8 mos.	9,659	79,545,986	15,160,959	103,786,908	14,427,872	22,618,540	3,172,631	32,619,729	3,443,624	76,102,809	73.3	27,684,099	18,049,465	18,132,751	21,426,197
Gulf, Colorado & Santa Fe	August	1,976	1,570,366	78,789	1,739,672	185,546	296,121	54,564	515,540	65,491	1,113,085	64.0	626,587	531,003	437,690	763,087
	8 mos.	1,976	11,380,554	712,281	12,874,215	2,055,784	2,828,367	455,779	4,385,381	658,259	10,357,946	80.5	2,516,269	1,735,909	861,560	1,673,927
Panhandle & Santa Fe	August	1,876	1,084,155	61,556	1,204,831	122,120	183,875	19,130	274,837	35,256	633,639	52.6	571,192	518,424	412,905	450,220
	8 mos.	1,800	7,161,049	506,654	8,203,988	1,289,215	1,718,516	161,520	2,429,048	298,690	5,871,257	71.6	2,332,731	1,891,739	1,041,511	1,108,168
Atlanta & West Point	August	93	123,590	23,581	167,189	27,195	30,719	9,642	64,098	11,999	147,350	88.1	19,839	8,294	—3,822	—6,553
	8 mos.	93	879,242	233,401	1,292,658	174,615	249,971	83,403	529,135	94,274	1,161,145	89.8	131,513	38,531	—39,077	35,104
Western of Alabama	August	133	103,495	24,373	142,290	18,472	38,666	10,037	58,378	11,799	140,550	98.8	1,740	—7,278	256	9,269
	8 mos.	133	929,509	247,507	1,319,882	193,246	317,870	88,737	498,242	95,931	1,220,516	92.5	99,366	8,661	57,419	200,951
Atlanta, Birmingham & Coast	August	639	245,916	12,066	283,896	61,775	60,845	25,791	128,744	18,210	303,755	107.0	—19,859	—35,889	—50,866	—21,539
	8 mos.	639	2,030,658	87,636	2,366,863	564,889	578,186	213,608	1,119,080	155,546	2,707,032	114.3	—340,169	—468,493	—622,996	—425,925
Atlantic Coast Line	August	5,162	2,209,554	331,445	2,865,259	617,513	898,880	140,621	1,432,511	161,055	3,271,105	114.2	—405,846	—706,971	—594,398	—230,475
	8 mos.	5,162	30,744,267	6,099,220	40,556,770	5,618,146	7,575,854	1,189,676	14,288,770	1,382,667	30,428,574	75.0	10,128,196	6,374,364	5,075,577	5,543,540
Charleston & Western Carolina	August	342	182,373	4,282	192,452	33,404	29,975	6,853	72,763	6,768	149,254	77.6	43,198	25,698	25,130	31,869
	8 mos.	342	1,684,372	38,667	1,781,328	286,040	237,556	58,108	641,135	51,200	1,271,817	71.4	509,511	347,988	313,003	168,430
Baltimore & Ohio	August	5,653	11,320,049	1,275,318	13,545,505	1,182,352	2,515,549	507,470	4,965,013	622,324	9,941,917	73.4	3,603,588	2,767,321	2,451,403	4,473,226
	8 mos.	5,653	91,544,039	10,386,392	109,795,507	9,785,167	23,325,540	4,101,887	41,082,908	5,275,784	84,796,025	77.2	24,999,482	18,874,587	16,699,306	25,845,160
Baltimore & Ohio, Chic. Term	August	85	.....	.....	321,290	32,984	43,363	2,244	153,906	17,834	255,198	79.4	66,092	12,830	79,053	128,033
	8 mos.	85	.....	.....	2,190,236	259,601	271,414	18,281	1,126,727	146,205	1,866,728	85.2	323,508	—59,512	638,940	767,882
Staten Island Rapid Transit	August	23	53,895	131,343	197,386	15,731	14,925	1,852	89,534	20,560	142,602	72.2	54,784	37,684	23,973	49,486
	8 mos.	23	446,564	955,052	1,474,607	106,373	112,041	16,424	733,446	136,882	1,105,166	74.9	369,441	230,141	120,554	225,497
Bangor & Aroostook	August	619	236,284	25,805	286,031	100,618	99,958	5,543	112,402	26,940	347,776	121.6	—61,745	—86,616	—74,221	—2,507
	8 mos.	619	4,211,450	303,516	4,724,829	966,396	938,945	45,956	1,198,322	224,403	3,391,179	71.8	1,333,650	934,912	936,025	1,615,019
Belt Ry. Co. of Chicago	August	53	.....	.....	464,192	38,349	54,382	3,371	221,757	8,934	326,793	70.4	137,399	61,977	92,580	150,879
	8 mos.	53	.....	.....	3,629,828	222,834	357,724	28,415	1,727,478	79,240	2,415,691	66.6	1,214,137	660,060	925,526	1,221,494
Bessemer & Lake Erie	August	226	1,029,029	2,575	1,042,707	109,715	171,554	11,700	217,917	37,522	550,579	52.8	492,128	442,382	433,405	835,093
	8 mos.	227	6,076,927	20,041	6,194,241	853,457	1,696,579	108,213	1,674,190	298,712	4,643,416	75.0	1,550,825	1,215,129	1,166,452	3,263,705
Boston & Maine	August	2,089	3,065,699	1,111,354	4,879,537	706,243	698,414	84,892	1,818,600	207,063	3,539,801	72.5	1,339,736	1,060,030	876,054	1,157,329
	8 mos.	2,089	26,150,550	8,151,474	39,941,430	6,044,259	5,608,190	676,373	14,814,989	1,745,950	29,050,747	72.7	10,890,683	8,747,922	7,024,036	7,928,300
Brooklyn Eastern Dist. Term	August	11	98,571	.....	99,647	9,845	15,261	5	30,968	5,772	61,851	62.1	37,796	31,350	31,350	28,017
	8 mos.	11	825,197	.....	836,549	82,518	96,713	4,299	260,372	46,602	490,504	58.6	346,045	291,959	291,959	296,444
Buffalo & Susquehanna	August	253	111,766	336	132,636	21,315	26,457	1,958	36,430	7,111	93,271	70.3	39,365	37,265	40,055	37,830
	8 mos.	253	919,633	3,243	1,039,222	199,417	255,737	16,513	307,219	56,282	835,168	80.4	204,054	187,254	241,150	268,269
Buffalo, Rochester & Pittsburgh	August	601	1,050,235	32,365	1,124,452	120,221	278,673	25,910	415,772	37,179	879,024	78.2	245,428	225,425	165,593	186,036
	8 mos.	601	8,000,686	281,868	8,588,039	1,037,684	2,299,632	222,791	3,440,664	316,553	7,330,621	85.4	1,257,418	1,096,190	975,345	1,347,313
Burlington-Rock Island	August	310	67,311	2,272	77,098	18,717	10,376	6,133	44,206	10,280	90,871	117.9	—13,773	—19,916	—35,649	—30,641
	8 mos.	345	861,549	21,410	933,304	196,272	127,005	52,146	418,612	84,060	874,601	93.7	58,703	599	—176,371	—767,860
Canadian Pac. Lines in Maine	August	233	80,036	21,984	112,963	110,216	30,639	6,874	60,627	3,990	212,346	187.9	—99,383	—111,383	—124,336	—52,249
	8 mos.	233	1,220,282	177,020	1,496,778	461,638	344,655	61,662	680,959	33,539	1,582,453	105.7	—85,675	—181,675	—338,684	—179,324
Canadian Pacific Lines in Vermont	August	85	60,469	33,952	120,006	15,486	21,273	2,069	76,399	2,285	117,496	97.9	2,510	—1,510	—26,151	26,714
	8 mos.	85	582,132	186,698	946,259	153,060	216,892	17,402	616,212	20,865	1,024,347	108.2	—78,088	—110,248	—323,081	—237,816
Central of Georgia	August	1,944	1,125,762	138,569	1,430,631	169,691	221,560	64,417	598,201	83,208	1,145,364	80.1	285,267	175,239	164,910	278,742
	8 mos.	1,944	9,464,466	1,384,196	12,167,716	1,207,012	2,162,233	528,715	5,139,533	639,010	9,756,255	80.2	2,411,461	1,475,555	1,368,329	2,204,547
Central New Jersey	August	692	2,408,901	735,469	3,365,957	315,293	554,410	61,373	1,322,493	100,692	2,374,236	70.5	991,721	501,677	423,480	1,063,235
	8 mos.	692	20,611,278	4,735,857	27,083,091	2,553,427	5,394,935	474,274	11,083,244	903,297	20,583,409	76.0	6,499,682	3,670,865	2,952,196	4,736,449
Central Vermont	August	456	444,965	82,588	589,520	64,703	102,209	18,118	247,972	20,263	455,475	77.3	134,045	115,994	105,869	123,272
	8 mos.	456	3,582,302	588,038	4,622,296	941,951	836,031	142,751	1,962,793	191,324	4,090,318	88.5	531,978	419,893	474,989	844,957
Chesapeake & Ohio	August	3,119	10,190,674	354,773	11,040,979	1,302,015	1,987,800	193,028	2,583,537	318,687	6,388,771	57.9	4,652,208	3,831,177	3,815,387	4,288,159
	8 mos.	3,119	73,968,142	2,923,197	80,837,484	10,609,196	15,343,300	1,395,499	20,461,323	2,700,718	50,620,397	62.6	30,217,087	23,414,218	23,380,350	25,737,634
Chicago & Eastern Illinois	August	938	1,082,831	162,932	1,359,255	165,716	256,203	66,914	571,957	57,147	1,127,660	83.0	231,595	116,513	—50,276	—46,877
	8 mos.	938	8,224,680	1,267,805	10,447,026	1,354,070	2,202,659	565,830	4,694,221	534,822	9,452,443	90.5	994,583	61,748	—1,095,369	—572,578
Chicago & Illinois Midland	August	131	220,384	2,272	231,003	26,642	42,022	28,412	63,734	17,920	176,348	76.3	54,655	48,370	47,715	56,669
	8 mos.	131	1,721,779	22,267	1,805,640	207,759	416,405	167,890	554,573	156,622	1,500,081	83.1	305,559	246,903	202,205	300,340

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1929.
Chicago & North Western	August	8,458	$7,197,372	$1,356,475	$9,558,195	$1,456,389	$1,844,184	$215,941	$3,498,976	$353,087	$7,403,325	77.5	$2,154,870	$1,428,650	$1,136,164	$2,621,509
	8 mos.	8,458	53,076,989	10,588,969	71,556,006	10,924,444	14,129,768	1,653,045	28,625,911	2,984,243	58,682,332	82.0	12,873,674	7,067,553	5,278,849	10,303,667
Chicago, Burlington & Quincy	August	9,306	7,690,778	1,117,143	9,814,776	1,290,261	1,179,908	242,055	2,851,960	346,311	5,996,951	61.1	3,817,825	2,866,416	2,623,844	3,590,898
	8 mos.	9,315	60,569,573	7,964,709	76,559,044	9,745,022	12,029,853	2,033,217	25,801,872	2,838,250	53,012,583	69.2	23,546,461	16,552,395	14,536,379	18,472,303
Chicago Great Western	August	1,495	1,563,438	116,834	1,795,692	277,929	210,677	79,829	630,544	57,323	1,260,896	70.2	534,796	463,669	234,560	324,173
	8 mos.	1,495	11,635,687	909,020	13,492,362	1,803,859	1,550,959	659,459	5,017,600	473,093	9,541,745	70.7	3,950,617	3,282,113	1,741,936	1,523,669
Chicago, Indianapolis & Louisville	August	647	771,576	85,331	951,176	97,212	184,307	34,120	381,290	33,537	737,208	77.5	213,968	148,383	27,328	98,151
	8 mos.	647	6,187,638	763,550	7,730,534	775,416	1,589,181	280,297	3,126,003	271,124	6,113,368	79.1	1,617,166	1,104,237	201,729	797,678
Chicago, Mil., St. Paul & Pacific	August	11,310	7,934,932	867,722	9,737,533	1,525,105	1,663,376	318,896	3,533,497	321,339	7,307,211	75.0	2,430,322	1,699,867	1,236,029	2,961,402
	8 mos.	11,320	62,546,535	6,376,163	76,545,284	12,424,394	15,280,233	2,318,421	29,597,678	2,692,245	62,258,951	81.3	14,286,333	8,146,129	4,905,867	9,322,447
Chicago River & Indiana	August	20	.....	.....	437,203	32,000	35,000	1,779	149,125	16,168	234,072	53.5	203,131	152,150	224,713	283,777
	8 mos.	20	.....	.....	3,665,226	314,000	300,000	14,883	1,257,490	145,821	2,032,194	55.4	1,633,032	1,268,912	1,857,340	2,062,916
Chicago, Rock Island & Pacific	August	7,593	6,397,605	860,996	7,958,269	1,068,880	1,544,805	234,707	2,928,227	334,195	6,138,124	77.1	1,820,145	1,295,671	874,011	2,473,152
	8 mos.	7,593	52,898,296	7,153,514	66,270,711	7,467,991	11,861,745	1,891,962	24,769,324	2,712,824	49,405,858	74.6	16,864,853	12,561,947	9,202,019	11,684,820
Chicago, Rock Island & Gulf	August	722	441,787	34,236	472,532	74,968	39,478	19,357	140,631	22,303	299,627	63.4	172,905	146,021	100,638	133,096
	8 mos.	662	3,703,425	340,831	4,195,561	524,851	322,352	164,520	1,300,637	178,852	2,516,605	60.0	1,678,956	1,486,441	1,214,221	1,158,923
Chic., St. Paul, Minn. & Omaha	August	1,736	1,381,474	239,118	1,769,261	256,000	292,501	40,052	747,462	82,599	1,430,256	80.8	339,005	235,264	148,227	492,991
	8 mos.	1,736	9,985,719	1,682,240	12,817,859	1,940,873	2,428,953	315,396	5,811,877	667,343	11,247,584	87.7	1,570,255	797,890	212,166	1,505,479
Clinchfield	August	309	413,085	5,996	428,076	46,316	108,536	18,137	90,669	21,051	284,709	66.5	143,367	83,366	103,369	102,730
	8 mos.	309	3,578,935	52,963	3,700,870	427,378	917,937	152,192	816,371	143,938	2,457,131	66.4	1,243,739	728,726	991,160	1,266,998
Colorado & Southern	August	1,037	533,100	70,314	665,781	121,554	108,429	12,394	228,508	38,233	512,907	77.0	152,874	84,366	52,881	71,382
	8 mos.	1,037	4,151,629	420,274	5,078,185	790,055	1,056,751	125,264	1,915,281	316,189	4,219,906	83.1	858,279	316,211	151,322	584,779
Ft. Worth & Denver City	August	693	561,768	78,779	712,664	76,057	100,934	20,508	193,554	36,601	431,436	60.5	281,228	248,594	208,129	165,317
	8 mos.	695	4,373,264	576,921	5,436,165	552,042	794,579	159,954	1,598,901	301,913	3,427,480	63.0	2,008,685	1,734,741	1,545,977	1,417,551
Wichita Valley	August	270	69,652	914	74,094	15,078	4,938	206	24,739	1,702	46,625	62.9	27,469	21,737	10,257	—26,960
	8 mos.	270	392,897	10,065	428,799	109,279	30,835	333	188,899	14,294	342,910	80.0	85,889	31,781	—52,629	—151,798
Columbus & Greenville	August	167	67,673	6,046	78,369	5,506	14,697	3,706	35,371	10,512	69,792	89.1	8,577	1,016	2,895	2,229
	8 mos.	167	612,953	49,774	702,913	108,249	107,927	31,197	284,452	90,570	622,381	88.5	80,532	55,759	64,700	85,397
Conemaugh & Black Lick	August	20	36,254	.....	58,436	6,028	10,954	418	26,108	3,297	46,799	80.1	11,637	10,737	13,527	25,873
	8 mos.	20	272,350	.....	521,546	67,656	136,620	4,104	333,262	27,555	569,197	109.1	—47,651	—54,851	—28,791	160,383
Delaware & Hudson	August	882	2,145,677	269,230	2,818,885	302,474	574,317	53,835	940,455	153,408	2,036,028	77.7	582,857	520,945	495,388	769,532
	8 mos.	882	17,950,415	1,467,545	20,889,641	3,096,268	5,172,525	456,155	7,931,149	1,222,468	17,939,927	85.9	2,949,714	2,306,989	2,357,365	3,594,862
Delaware, Lackawanna & Western	August	998	3,281,599	801,254	4,772,558	567,175	958,293	130,222	2,023,721	161,596	3,882,079	81.3	890,479	445,185	460,252	1,190,046
	8 mos.	998	28,823,123	5,932,766	40,214,043	4,075,212	7,633,908	1,098,300	17,039,251	1,399,180	31,569,649	78.5	8,644,394	4,993,155	4,929,236	7,296,268
Denver & Rio Grande Western	August	2,557	1,686,849	213,853	2,042,097	270,592	305,309	47,448	617,082	80,690	1,343,076	65.8	699,021	549,032	537,155	648,602
	8 mos.	2,548	12,541,488	1,239,294	14,888,203	1,836,194	3,189,814	431,984	4,724,993	683,183	10,995,394	73.9	3,892,809	2,586,490	2,703,948	3,821,277
Denver & Salt Lake	August	232	239,494	8,392	269,709	33,802	23,828	2,044	36,655	10,494	106,823	39.6	162,886	146,886	148,094	60,057
	8 mos.	232	1,131,500	70,296	1,316,340	252,396	279,582	15,500	244,739	85,836	878,053	66.7	438,287	310,270	353,706	393,823
Detroit & Mackinac	August	242	77,409	7,983	94,128	12,691	12,190	1,190	27,395	3,771	57,212	60.8	36,916	29,690	29,309	3,739
	8 mos.	242	590,088	42,327	700,711	126,028	123,690	11,036	219,406	34,511	511,897	73.1	188,814	147,046	140,146	2,397
Detroit & Toledo Shore Line	August	50	203,544	.....	205,563	28,143	26,004	7,528	58,037	7,871	125,694	61.1	79,869	59,476	22,004	21,085
	8 mos.	50	2,000,796	.....	2,029,889	232,065	215,503	61,429	569,717	64,323	1,137,528	56.0	892,361	708,079	320,824	522,561
Detroit Terminal	August	19	.....	.....	57,739	5,733	7,886	.....	32,375	3,611	49,605	85.9	8,134	—3,847	—9,614	12,145
	8 mos.	19	.....	.....	658,834	67,785	71,026	36	353,485	32,042	524,374	79.6	134,460	34,684	—28,583	102,182
Detroit, Toledo & Ironton	August	487	358,641	1,200	374,911	39,002	54,642	12,397	141,743	23,771	269,413	71.9	105,498	57,348	39,856	126,615
	8 mos.	494	4,240,199	8,795	4,376,463	509,891	653,790	101,791	1,441,833	237,294	2,932,004	67.0	1,444,459	1,057,913	921,542	2,708,611
Duluth, Missabe & Northern	August	563	1,824,097	4,271	2,080,370	221,246	238,998	2,461	340,388	40,198	843,240	40.5	1,237,130	1,144,055	1,141,620	2,113,633
	8 mos.	564	6,867,897	29,213	7,862,667	1,757,587	2,298,885	31,613	2,038,049	314,600	6,440,421	81.9	1,422,246	830,672	826,744	5,773,428
Duluth, Winnipeg & Pacific	August	178	75,148	11,065	93,092	29,278	27,964	3,628	46,761	6,286	116,109	124.7	—23,017	—27,997	—37,873	—18,096
	8 mos.	178	704,630	59,369	818,064	228,324	275,554	34,187	430,217	56,756	1,036,890	126.7	—218,826	—260,206	—229,271	—4,920
Elgin, Joliet & Eastern	August	447	849,819	12	937,543	167,582	222,373	16,535	425,800	49,944	882,279	94.1	55,264	—61,078	—111,813	780,373
	8 mos.	447	9,075,756	41	9,972,126	1,393,388	2,071,127	124,849	4,184,591	428,616	8,200,972	82.2	1,771,154	823,192	271,493	2,670,509
Erie Railroad	August	2,046	5,543,666	723,446	6,897,152	991,533	1,374,124	159,251	2,602,378	277,740	5,439,953	78.9	1,457,199	1,042,909	871,465	1,370,631
	8 mos.	2,046	44,512,816	5,359,354	54,634,775	6,901,532	11,697,121	1,318,662	21,058,790	2,257,132	43,490,446	79.6	11,144,329	7,999,876	7,227,796	8,622,205
Chicago & Erie	August	269	766,077	37,976	863,897	131,326	121,836	28,075	271,798	39,553	591,685	68.5	272,212	216,203	—13,996	50,689
	8 mos.	269	6,518,140	307,022	7,347,213	926,866	936,545	232,729	2,231,790	330,609	4,654,538	63.4	2,692,675	2,244,215	301,103	902,556

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
New Jersey & New York	August	45	$23,326	$83,417	$109,863	$15,438	$27,443	$1,330	$59,164	$3,448	$106,823	97.2	$3,040	—$1,335	—$24,401	—$11,778
	8 mos.	45	192,925	676,110	897,834	93,437	179,612	11,086	454,782	28,417	767,323	85.5	130,511	95,370	—125,098	—164,853
N. Y., Susquehanna & Western	August	131	274,264	34,470	331,943	48,612	54,992	4,494	133,197	11,675	252,968	76.2	78,975	46,265	27,079	70,843
	8 mos.	131	2,469,842	277,834	2,982,011	342,228	402,064	38,170	1,195,312	101,610	2,079,232	69.7	902,779	640,334	428,336	397,103
Florida East Coast	August	864	245,860	71,661	382,414	114,690	115,982	22,875	167,646	45,929	473,513	123.8	—91,099	—193,288	—243,235	—179,393
	8 mos.	864	4,101,015	2,078,673	7,117,307	971,007	1,179,536	230,442	2,062,869	368,972	4,932,309	69.3	2,184,998	1,268,177	763,734	1,065,224
Fort Smith & Western	August	249	53,576	3,012	61,010	14,693	16,174	4,631	25,051	4,684	65,228	106.9	—4,218	—7,830	—17,095	623
	8 mos.	249	445,908	25,027	514,225	109,129	111,735	38,247	225,992	43,382	524,082	101.9	—9,857	—38,726	—110,172	—13,931
Galveston Wharf	August	13	.....	.....	193,482	45,900	4,534	4,538	31,916	6,039	110,367	57.0	83,115	60,115	60,015	80,120
	8 mos.	13	.....	.....	1,159,340	291,322	38,480	31,898	229,732	64,493	774,898	66.8	384,442	200,207	201,907	177,940
Georgia R.R.	August	328	295,667	29,853	348,307	41,438	63,724	20,537	154,213	22,715	303,194	87.1	45,113	37,301	42,273	67,771
	8 mos.	328	2,390,386	238,188	2,847,403	297,779	529,431	169,581	1,267,005	184,912	2,452,120	86.1	395,283	332,756	411,852	458,082
Georgia & Florida	August	463	151,640	3,487	160,264	33,543	20,159	10,393	47,860	7,379	119,384	74.5	40,880	33,380	31,079	86,099
	8 mos.	463	936,027	27,238	1,013,283	242,445	167,583	83,375	396,353	61,239	952,206	94.0	61,077	1,075	—32,995	49,067
Grand Trunk Western	August	1,021	1,295,804	131,694	1,546,406	350,809	349,377	53,244	652,050	95,879	1,508,594	97.6	37,812	—79,575	—204,447	—141,285
	8 mos.	1,020	12,415,079	934,198	14,409,963	2,264,962	2,948,573	501,093	6,322,244	830,937	12,913,857	89.6	1,496,106	549,253	—769,874	698,052
Can. Nat'l. Lines in New Eng.	August	172	150,693	18,275	186,135	22,164	19,346	4,241	67,979	8,851	124,291	66.8	61,844	48,534	—1,004	—58,770
	8 mos.	172	802,832	121,602	1,046,700	225,039	275,477	41,136	641,193	70,014	1,275,140	121.8	—228,440	—344,355	—713,524	—716,358
Great Northern	August	8,347	5,828,192	596,823	7,161,174	826,928	1,088,540	189,346	2,214,382	219,947	4,598,847	64.2	2,562,327	1,922,328	1,762,457	3,294,651
	8 mos.	8,364	41,127,979	4,249,890	50,565,374	7,193,705	10,377,691	1,787,774	17,379,825	1,832,433	38,978,233	77.1	11,587,141	6,265,045	5,205,439	8,538,045
Green Bay & Western	August	234	116,041	2,073	124,404	21,094	13,192	5,720	48,032	2,620	90,646	72.9	33,758	27,721	26,510	9,296
	8 mos.	234	917,927	13,683	959,588	172,939	175,347	46,036	396,674	23,876	814,582	84.9	145,006	86,969	71,089	171,945
Gulf & Ship Island	August	307	98,402	14,991	130,459	33,825	18,785	4,427	65,378	6,170	129,722	99.4	737	—23,270	—35,196	—14,477
	8 mos.	307	850,595	143,260	1,172,222	307,658	206,102	35,130	601,805	53,574	1,213,507	103.5	—41,285	—275,502	—379,988	—70,032
Gulf, Mobile & Northern	August	733	307,302	11,493	336,016	44,963	61,241	20,405	123,923	17,384	267,916	82.65	68,100	40,981	24,633	45,854
	8 mos.	733	2,584,171	95,174	2,819,678	440,149	504,057	201,117	1,056,798	168,867	2,371,813	84.12	447,865	230,740	38,184	366,459
Illinois Central	August	5,018	6,788,924	998,127	8,372,911	993,499	1,598,457	228,511	3,340,985	341,065	6,558,053	78.3	1,814,858	1,404,419	1,298,490	1,532,629
	8 mos.	5,018	54,005,095	8,760,089	68,935,647	8,293,408	15,448,654	1,927,296	27,458,783	2,897,976	56,538,012	82.0	12,397,635	7,693,546	6,714,290	11,725,578
Yazoo & Mississippi Valley	August	1,681	1,297,194	125,615	1,515,813	230,515	222,969	39,472	582,444	70,583	1,148,981	75.8	366,832	239,829	123,572	—37,052
	8 mos.	1,683	9,609,466	1,045,111	11,396,055	1,934,818	2,103,006	330,437	4,948,127	545,509	9,883,852	86.7	1,514,783	215,292	—782,843	1,109,007
Illinois Central System	August	6,700	8,086,118	1,123,742	9,888,724	1,224,014	1,821,426	267,983	3,923,429	411,648	7,707,034	77.9	2,181,690	1,644,248	1,422,062	1,495,577
	8 mos.	6,701	63,614,561	9,805,200	80,334,282	10,228,226	17,551,660	2,257,733	32,406,910	3,443,485	66,421,864	82.7	13,912,418	7,908,838	5,931,447	12,838,029
Illinois Terminal	August	552	487,692	77,374	597,050	74,018	65,829	18,141	184,375	30,894	371,097	62.16	225,953	193,447	156,770	152,827
	8 mos.	556	3,545,124	680,871	4,435,355	510,100	551,567	157,245	1,420,239	287,641	2,916,212	65.75	1,519,143	1,269,215	1,040,139	932,973
Kansas City Southern	August	784	900,136	43,640	1,058,022	104,117	163,454	44,901	317,149	62,632	696,138	65.8	361,884	260,440	203,408	447,269
	8 mos.	784	7,221,876	360,497	8,576,796	802,644	1,445,922	419,007	2,661,550	544,425	5,870,652	68.4	2,706,144	1,930,829	1,627,013	2,427,620
Texarkana & Ft. Smith	August	99	157,682	2,679	173,054	19,807	11,777	6,204	42,615	10,112	92,908	53.7	80,146	71,367	48,064	45,353
	8 mos.	99	1,163,510	23,843	1,339,079	131,638	94,573	57,787	364,273	80,632	745,292	55.7	593,787	524,390	330,248	327,785
Kansas, Oklahoma & Gulf	August	326	235,425	634	240,278	32,532	17,182	12,304	54,833	9,909	126,569	52.7	113,709	94,105	71,411	70,688
	8 mos.	326	1,730,134	8,764	1,773,734	212,243	197,985	109,750	421,767	90,926	1,027,186	57.9	746,548	597,526	439,192	564,955
Lake Superior & Ishpeming	August	160	146,575	215	171,709	26,404	24,435	525	33,714	8,029	93,107	54.2	78,602	56,429	54,622	172,068
	8 mos.	160	766,262	3,735	885,057	185,890	202,648	4,786	252,078	62,352	707,743	80.0	177,314	35,026	22,073	446,407
Lake Terminal	August	12	.....	.....	63,406	4,678	4,409	.....	25,802	2,042	36,931	58.2	26,475	21,845	23,708	18,032
	8 mos.	12	.....	.....	447,715	61,403	67,907	.....	234,542	16,421	380,273	84.9	67,442	33,780	29,971	39,543
Lehigh & Hudson River	August	96	164,865	803	174,105	18,329	22,316	3,430	58,979	8,834	111,888	64.3	62,217	46,566	31,053	37,308
	8 mos.	96	1,282,819	5,912	1,357,388	156,925	218,458	29,822	479,953	75,078	960,236	70.7	397,152	285,978	151,336	178,487
Lehigh & New England	August	216	327,540	867	331,959	48,787	79,515	4,469	114,360	16,408	263,526	79.4	68,433	57,700	64,371	119,644
	8 mos.	216	2,749,825	6,523	2,782,990	383,975	630,354	40,927	993,114	169,435	2,217,718	79.7	565,272	474,144	546,152	651,348
Lehigh Valley	August	1,361	3,223,455	396,708	3,946,101	461,816	900,558	130,690	1,702,442	128,526	3,347,876	84.8	598,225	301,651	238,523	775,959
	8 mos.	1,361	28,843,434	2,936,911	34,610,526	3,360,750	7,929,633	1,056,833	14,682,325	1,070,852	28,284,552	81.7	6,325,974	3,982,427	3,169,025	5,283,638
Louisiana & Arkansas	August	608	522,991	16,294	566,372	65,842	74,614	20,837	129,534	24,218	315,521	55.7	250,851	195,227	168,874	80,402
	8 mos.	608	3,538,066	109,273	3,865,377	547,035	512,185	166,409	1,040,091	185,271	2,453,366	63.5	1,412,011	1,025,530	879,372	774,591
Louisiana, Arkansas & Texas	August	202	56,915	839	60,276	17,541	8,102	3,605	21,880	4,734	55,862	92.7	4,414	1,914	—3,673	—14,528
	8 mos.	202	454,618	9,149	485,837	141,633	69,871	27,887	198,852	36,841	474,984	97.8	10,853	—18,123	—71,677	—171,772
Louisville & Nashville	August	5,264	6,107,733	646,905	7,202,965	1,075,614	1,521,670	206,480	2,649,016	368,333	5,862,290	81.4	1,340,675	896,911	953,247	1,002,036
	8 mos.	5,266	50,675,213	5,743,161	60,646,575	9,051,147	13,273,730	1,828,805	22,759,898	3,043,326	50,263,791	82.9	10,382,784	6,522,805	6,535,992	7,572,783

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1929.
Maine Central	August	1,121	$889,337	$235,010	$1,271,428	$219,013	$183,315	$22,606	$490,084	$43,039	$964,478	75.9	$306,950	$216,758	$187,903	$275,689
	8 mos.	1,121	7,892,894	1,504,435	10,406,417	1,652,620	1,726,195	155,780	4,084,056	367,276	8,003,625	76.9	2,402,792	1,730,605	1,343,008	1,996,715
Midland Valley	August	363	186,940	1,354	194,417	29,758	15,786	4,245	46,508	7,850	103,766	53.4	90,651	78,652	65,351	89,834
	8 mos.	363	1,317,725	20,764	1,388,391	240,106	155,677	40,318	376,827	83,218	892,206	64.3	496,185	395,253	306,450	556,993
Minneapolis & St. Louis	August	1,627	820,032	40,792	918,972	141,822	182,662	37,774	406,034	44,931	813,464	88.5	105,508	55,131	924	223,553
	8 mos.	1,627	6,437,178	266,183	7,157,892	959,225	1,430,660	297,365	3,319,311	390,600	6,394,639	89.3	763,253	346,295	103,331	173,374
Minneapolis, St. Paul & S. S. Marie	August	4,352	2,008,016	263,119	2,543,973	334,673	409,839	83,246	1,012,470	120,365	1,987,874	78.1	556,099	340,234	185,722	805,802
	8 mos.	4,376	16,406,793	1,593,622	19,823,723	2,852,971	3,958,105	616,604	8,233,119	977,115	16,748,142	84.5	3,075,581	1,387,270	289,516	1,697,776
Duluth, South Shore & Atlantic	August	560	195,767	23,909	250,384	47,941	32,574	7,803	102,807	10,144	203,210	81.2	47,174	18,174	12,575	7,347
	8 mos.	560	1,557,777	178,264	1,938,986	409,959	354,169	62,485	876,915	79,327	1,796,756	92.7	142,230	—96,804	—141,801	44,062
Spokane International	August	163	62,094	4,077	71,217	20,930	6,924	3,281	24,487	5,554	61,861	86.9	9,356	4,288	—602	25,403
	8 mos.	163	464,802	29,268	533,872	122,119	52,076	26,706	199,951	45,138	451,068	84.5	82,804	42,381	10,515	44,302
Mississippi Central	August	150	90,162	3,396	96,010	10,596	9,101	8,448	25,505	6,072	59,722	62.2	36,288	30,678	25,155	22,093
	8 mos.	150	646,395	19,463	687,029	109,404	97,736	69,658	205,543	51,901	534,214	77.8	152,815	107,838	75,215	124,264
Missouri & North Arkansas	August	364	83,612	2,293	92,167	26,206	12,180	9,473	34,320	7,380	89,505	97.1	2,662	205	—9,631	19
	8 mos.	364	743,913	18,939	812,271	186,133	113,721	75,093	325,856	64,046	763,825	94.0	48,446	27,977	—56,681	40,148
Missouri-Illinois	August	202	133,222	904	136,335	20,185	22,430	2,873	37,047	5,809	87,908	64.5	48,427	41,882	30,070	37,633
	8 mos.	202	888,482	7,629	915,660	145,290	192,838	27,233	281,103	49,212	693,894	75.8	221,766	173,361	105,823	213,265
Missouri-Kansas-Texas Lines	August	3,293	2,405,903	273,352	2,944,741	376,744	363,342	126,425	960,715	146,176	1,990,892	67.6	953,849	740,754	497,631	893,647
	8 mos.	3,214	18,063,932	2,392,480	22,755,299	2,902,046	3,996,289	1,022,219	7,965,101	1,279,782	17,306,972	76.1	5,448,327	3,798,047	2,111,878	5,003,323
Missouri Pacific	August	7,446	7,344,107	650,954	8,669,144	1,054,830	1,506,205	257,701	2,954,013	302,945	6,081,310	70.2	2,587,834	2,264,326	1,830,020	2,208,354
	8 mos.	7,448	55,685,764	5,147,485	66,685,788	7,997,392	11,285,098	2,203,784	23,966,177	2,709,836	48,260,135	72.4	18,425,653	15,151,398	12,108,592	13,492,836
Gulf Coast Lines	August	1,037	657,839	54,220	755,272	85,422	151,782	41,802	207,907	54,999	544,921	72.15	210,351	161,365	140,274	266,890
	8 mos.	1,037	7,151,240	578,922	8,208,698	1,134,809	1,383,750	352,946	2,266,435	479,614	5,620,714	68.47	2,587,984	2,194,440	1,520,569	2,627,300
International Great Northern	August	1,159	1,635,801	100,676	1,838,504	244,188	259,427	37,539	632,532	55,983	1,244,430	67.68	594,074	550,996	342,787	151,095
	8 mos.	1,159	11,885,415	879,977	13,627,209	1,799,946	2,058,385	304,586	5,064,286	517,720	9,721,771	71.34	3,905,438	3,568,392	2,118,783	243,149
San Antonio, Uvalde & Gulf	August	316	92,978	7,858	108,412	28,668	16,837	5,265	39,318	5,789	96,218	88.8	12,194	6,951	—17,901	39,295
	8 mos.	316	863,483	80,569	1,017,886	277,350	138,803	43,571	252,925	51,805	763,296	75.0	254,590	216,595	—3,566	135,866
Mobile & Ohio	August	1,152	725,316	39,171	808,791	133,826	158,525	40,881	344,254	47,034	722,620	89.3	86,171	43,061	—12,158	63,752
	8 mos.	1,152	6,416,316	297,439	7,146,829	1,016,943	1,369,778	401,154	2,978,834	394,574	6,149,058	86.0	997,771	493,780	8,160	676,845
Monongahela	August	177	349,662	2,502	354,375	25,000	45,000	1,264	86,914	9,725	167,903	47.4	186,472	169,329	96,094	131,682
	8 mos.	177	3,203,823	22,795	3,249,927	445,000	360,000	10,432	778,990	82,205	1,676,170	51.6	1,573,757	1,454,083	824,972	908,420
Monongahela Connecting	August	6	.....	.....	74,279	9,975	22,292	250	43,021	2,505	78,043	105.1	—3,764	—9,142	—8,358	14,065
	8 mos.	6	.....	.....	762,997	105,129	198,851	2,274	401,136	22,437	729,827	95.7	33,170	—9,497	—7,989	190,037
Montour	August	57	201,077	.....	202,060	41,536	40,182	1,497	41,469	7,136	130,021	64.3	72,039	69,970	91,609	79,910
	8 mos.	57	1,413,874	.....	1,421,985	175,147	329,953	11,336	370,623	59,380	944,517	66.4	477,468	460,918	597,678	616,513
Nashville, Chatt. & St. Louis	August	1,203	928,642	125,387	1,158,570	202,642	262,637	64,737	491,514	71,842	1,098,565	94.8	60,005	7,942	—10,036	188,690
	8 mos.	1,203	8,634,577	1,039,206	10,646,756	1,859,606	2,222,432	563,691	4,222,232	617,857	9,532,356	89.5	1,114,400	663,683	523,684	1,534,891
Nevada Northern	August	165	27,090	924	32,776	11,370	5,691	975	9,405	4,363	31,804	97.4	972	—9,447	—5,111	21,856
	8 mos.	165	286,119	13,615	340,535	91,005	39,148	8,008	91,294	37,318	266,720	78.3	73,815	—246,346	—225,986	162,301
Newburgh & South Shore	August	6	.....	.....	48,879	17,534	16,085	.....	21,919	5,831	26,301	53.8	22,578	10,710	14,169	—4,712
	8 mos.	6	.....	.....	694,606	114,547	184,077	.....	322,370	54,148	675,142	97.2	19,464	—69,856	—46,775	181,480
New Orleans Great Northern	August	264	181,696	13,968	203,926	14,389	26,529	15,130	57,033	9,464	122,545	60.1	81,381	70,990	44,204	37,958
	8 mos.	264	1,438,718	47,096	1,574,612	142,873	216,911	116,532	460,628	83,870	1,020,814	64.8	553,798	470,840	297,796	206,476
New Orleans Terminal	August	20	2,622	.....	168,665	10,617	8,012	.....	47,243	1,487	67,359	39.9	101,306	89,336	61,800	28,757
	8 mos.	20	16,806	.....	1,129,646	134,202	72,557	.....	386,537	12,776	606,072	53.7	523,574	427,896	257,527	302,356
New York Central	August	11,421	21,026,808	7,532,252	32,679,061	4,618,158	6,533,661	762,746	12,244,518	1,297,838	25,951,359	79.4	6,727,702	4,061,482	2,973,541	4,382,561
	8 mos.	11,421	170,051,422	60,677,120	265,060,322	33,269,222	56,369,727	5,985,791	100,068,381	10,744,642	210,604,598	79.5	54,455,724	32,364,651	22,463,816	41,024,175
Indiana Harbor Belt	August	118	.....	.....	747,397	84,000	75,000	4,700	300,548	27,345	506,259	67.7	241,138	197,254	117,380	208,674
	8 mos.	118	.....	.....	6,240,462	574,000	720,000	37,168	2,786,071	226,964	4,477,606	71.8	1,762,856	1,411,144	1,035,134	1,677,975
Pittsburgh & Lake Erie	August	234	1,340,410	87,923	1,473,050	154,506	479,302	33,754	584,811	75,558	1,331,407	90.4	141,643	43,004	225,391	758,009
	8 mos.	234	11,329,021	844,763	12,549,764	1,198,364	3,813,790	270,314	4,910,812	622,707	10,844,537	86.4	1,705,227	858,144	2,341,215	5,100,471
New York, Chicago & St. Louis	August	1,698	2,853,259	148,986	3,129,199	494,169	511,021	118,515	1,190,581	119,119	2,405,907	76.9	723,292	512,867	259,260	603,220
	8 mos.	1,698	23,500,432	1,042,947	25,482,879	3,313,460	4,396,784	983,276	9,636,888	1,013,704	19,348,845	75.9	6,134,034	4,347,389	2,143,954	4,178,279
N. Y., New Haven & Hartford	August	2,096	4,495,667	2,878,682	8,260,810	1,362,471	1,238,153	89,468	2,753,509	288,586	5,874,312	71.1	2,386,498	2,036,828	1,438,786	2,442,504
	8 mos.	2,110	36,932,389	23,709,814	68,398,163	9,472,971	10,220,257	779,520	23,128,795	2,382,631	47,256,594	69.1	21,141,569	17,235,129	12,412,150	16,085,560

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
New York Connecting	August	20	$165,334	.....	$180,290	$28,987	$9,056	.....	$32,313	$1,975	$72,331	40.1	$107,959	$71,959	$40,671	$75,530
	8 mos.	20	1,339,347	.....	1,486,270	175,910	61,140	.....	286,467	9,875	533,392	35.8	954,878	663,278	433,824	653,104
New York, Ontario & Western	August	568	757,249	294,783	1,203,546	180,351	177,224	15,534	423,784	28,172	827,796	68.8	375,750	332,189	258,761	285,503
	8 mos.	568	5,738,426	933,802	7,833,728	946,682	1,316,707	120,807	2,996,098	225,346	5,633,713	71.9	2,200,015	1,858,628	1,319,912	656,258
Norfolk & Western	August	2,282	6,462,656	241,838	6,926,662	809,177	1,251,670	125,607	1,739,654	258,785	4,192,681	60.5	2,733,981	2,083,370	2,267,424	3,262,507
	8 mos.	2,249	49,487,557	1,867,095	53,329,674	6,464,671	10,521,166	994,269	14,101,380	2,081,154	34,226,430	64.2	19,103,244	13,624,401	14,698,486	22,278,818
Norfolk Southern	August	932	415,025	21,851	458,399	78,558	65,356	24,840	202,574	23,887	395,198	86.2	63,201	14,203	3,478	22,354
	8 mos.	932	3,884,582	134,876	4,220,865	637,668	646,858	204,381	1,718,347	199,313	3,405,355	80.7	815,510	424,570	280,998	422,748
Northern Pacific	August	6,789	4,550,776	533,444	5,620,924	599,707	1,004,495	182,142	2,018,611	252,384	4,167,792	74.2	1,453,132	772,498	990,444	1,736,756
	8 mos.	6,789	33,762,782	3,970,290	41,855,415	6,069,741	9,882,008	1,664,142	16,039,593	2,051,148	36,387,804	86.9	5,467,611	188,475	2,507,744	5,904,462
Northwestern Pacific	August	441	295,053	134,291	464,342	67,836	58,802	5,556	189,368	16,942	358,008	77.8	126,274	95,384	82,947	210,115
	8 mos.	441	1,631,390	944,838	2,859,665	645,389	515,215	48,221	1,434,324	136,260	2,775,434	97.1	84,231	—193,877	—278,570	135,092
Oklahoma City-Ada-Atoka	August	132	41,361	1,385	45,252	17,960	4,436	1,564	16,302	2,923	38,619	85.3	6,633	1,503	—9,650	—2,166
	8 mos.	132	443,041	11,905	473,521	125,350	30,285	10374	139,272	24,181	323,511	68.3	150,010	109,740	13,699	—38,528
Pennsylvania Railroad	August	10,914	26,546,350	7,476,217	37,767,229	3,960,556	7,369,298	732,357	14,569,488	1,527,558	28,632,253	75.8	9,134,976	5,742,437	4,383,538	8,462,442
	8 mos.	10,914	218,134,490	61,243,462	310,202,466	38,284,635	65,634,465	6,307,725	120,729,808	12,717,815	248,015,298	80.0	62,187,168	40,494,867	31,138,756	64,143,652
Long Island	August	404	730,839	2,611,875	3,513,473	285,285	409,536	16,057	1,255,734	55,579	2,022,914	57.6	1,490,559	1,008,051	781,691	1,150,831
	8 mos.	404	6,415,297	17,253,248	24,913,060	2,275,154	3,676,191	142,894	9,779,464	491,237	16,366,352	65.7	8,546,708	6,322,596	4,869,117	5,380,832
Peoria & Pekin Union	August	17	7,239	359	86,967	13,042	8,169	4,327	46,856	7,087	79,481	91.4	7,486	—7,014	12,851	38,580
	8 mos.	17	68,027	3,711	754,984	101,034	90,430	39,270	385,755	60,493	676,982	89.7	78,002	—45,781	148,684	228,861
Pere Marquette	August	2,264	1,923,054	186,448	2,271,845	394,778	443,350	76,867	907,932	99,083	1,930,690	85.0	341,155	202,504	101,017	693,177
	8 mos.	2,265	16,462,280	1,115,297	18,743,021	3,136,890	3,731,763	572,541	7,544,806	851,641	15,900,842	84.8	2,842,179	1,631,389	886,936	3,344,075
Pittsburgh & Shawmut	August	102	59,208	294	60,165	11,893	18,660	1,468	16,994	3,709	52,724	87.6	7,441	6,366	7,734	21,284
	8 mos.	102	602,504	9,345	617,826	99,462	167,631	12,153	166,626	31,307	477,179	77.2	140,647	130,107	137,560	223,741
Pittsburgh & West Virginia	August	138	222,772	1,705	243,732	29,908	67,108	17,419	61,171	14,185	198,363	81.4	45,369	15,816	40,815	173,082
	8 mos.	109	1,807,275	16,489	2,014,752	223,048	533,640	154,480	441,620	140,831	1,565,585	77.7	449,166	237,892	446,327	1,157,665
Pittsburgh, Shawmut & Northern	August	198	109,169	522	111,117	20,771	17,839	1,403	33,691	6,548	80,252	72.2	30,865	28,067	24,656	12,578
	8 mos.	198	857,[illegible]28	3,147	876,959	155,250	157,690	11,730	299,769	53,971	678,410	77.3	198,549	175,982	146,680	99,696
Quincy, Omaha & Kansas City	August	249	62,324	3,145	70,175	28,205	3,058	760	18,891	1,917	52,636	75.0	17,539	12,771	9,853	10,787
	8 mos.	249	285,719	27,009	353,779	152,964	43,399	6,984	156,428	17,855	376,826	106.5	—23,047	—61,108	—80,832	—67,976
Reading	August	1,459	4,900,316	354,818	5,568,669	835,082	1,414,802	89,736	2,321,961	195,969	4,874,771	87.5	693,898	485,781	446,073	755,248
	8 mos.	1,456	41,800,442	3,151,463	48,052,936	7,478,555	12,711,136	742,704	19,853,007	1,762,425	42,715,181	88.9	5,337,755	3,576,011	3,342,484	7,100,256
Atlantic City	August	163	90,007	322,274	437,611	22,762	26,586	4,783	197,302	3,905	255,492	58.4	182,119	141,669	128,411	118,763
	8 mos.	163	826,384	1,068,813	2,018,393	380,643	172,168	36,527	1,302,152	38,673	1,931,550	95.7	86,843	—237,786	—321,390	—416,585
Richmond, Fredericksburg & Potomac	Aug.	117	338,214	148,802	589,766	98,823	146,702	10,276	245,385	36,462	548,856	93.1	40,910	20,416	—11,753	60,409
	8 mos.	117	3,668,438	1,777,944	6,629,322	623,647	1,195,238	75,931	2,367,332	296,464	4,706,071	71.0	1,923,251	1,550,407	1,053,472	981,531
Rutland	August	413	240,500	72,092	423,707	82,773	72,582	10,546	165,075	15,189	348,428	82.2	75,279	54,321	61,021	70,722
	8 mos.	413	1,830,927	483,394	3,055,589	620,149	599,494	89,245	1,319,676	135,644	2,766,579	90.5	289,010	121,740	159,846	379,781
St. Louis-San Francisco	August	5,266	3,920,545	470,503	4,746,403	522,843	811,645	122,459	1,579,625	191,544	3,265,682	68.8	1,480,721	1,122,251	1,081,001	1,702,789
	8 mos.	5,266	30,839,544	3,837,438	37,924,308	4,063,741	6,769,222	952,562	13,617,884	1,618,129	27,305,385	72.0	10,618,923	7,830,070	7,446,372	10,905,786
Ft. Worth & Rio Grande	August	233	43,204	3,524	53,662	16,960	11,902	2,590	32,354	3,984	67,697	126.2	—14,035	—18,683	—26,289	—26,836
	8 mos.	233	382,795	29,850	468,948	147,919	107,653	25,311	277,064	35,060	592,532	126.4	—123,584	—160,266	—232,586	—198,389
St. Louis-San Francisco & Texas	August	262	134,945	4,639	144,272	24,283	19,394	6,215	56,757	8,364	114,978	79.7	29,294	24,458	—4,142	22,331
	8 mos.	262	861,616	52,308	955,624	186,340	151,394	46,393	415,009	61,378	861,171	90.1	94,453	60,353	—187,766	—90,497
St. Louis Southwestern Lines	August	1,913	1,336,599	31,739	1,450,428	141,855	207,443	77,639	449,984	71,724	955,438	65.9	494,990	403,612	250,547	198,755
	8 mos.	1,913	11,285,693	322,546	12,376,289	1,446,143	1,809,599	769,048	4,212,611	655,888	8,940,207	72.2	3,436,082	2,719,609	1,460,727	1,684,961
San Diego & Arizona	August	155	30,513	12,824	46,102	10,592	13,971	2,668	19,502	6,816	54,558	118.3	—8,456	—12,924	—10,854	—462
	8 mos.	155	462,245	113,159	591,079	110,067	115,784	27,141	179,789	56,575	498,042	84.3	93,037	50,629	64,429	170,032
Seaboard Air Line	August	4,478	2,388,098	249,404	2,915,399	420,594	673,733	169,188	1,182,214	174,637	2,618,300	89.8	297,099	93,842	101,044	261,004
	8 mos.	4,480	24,488,276	3,195,576	30,586,646	4,933,568	5,793,620	1,430,762	11,193,423	1,413,879	25,041,373	81.9	5,545,273	3,131,056	2,464,549	4,119,206
Southern Ry.	August	6,730	6,543,832	1,080,129	8,251,286	1,250,801	1,620,401	198,075	3,028,374	331,449	6,487,158	78.6	1,764,128	1,137,042	963,872	2,039,583
	8 mos.	6,730	53,522,061	8,796,701	67,734,290	10,489,624	14,091,297	1,754,124	25,656,429	2,741,961	55,226,736	81.5	12,507,554	7,323,469	5,663,541	11,973,227
Alabama Great Southern	August	315	412,518	78,776	531,071	117,501	111,628	16,774	188,839	19,997	459,158	86.5	71,913	31,202	40,800	99,051
	8 mos.	315	3,396,307	566,639	4,279,110	875,000	1,031,611	130,589	1,549,415	175,141	3,797,025	88.7	482,085	140,598	238,027	771,317
Cinn. New Orleans & Tex. Pac.	August	338	1,255,639	104,383	1,422,722	229,332	292,413	34,597	361,961	52,413	975,168	68.5	447,554	366,724	354,549	340,494
	8 mos.	338	8,846,598	1,004,208	10,485,319	1,887,936	2,514,966	279,682	3,158,710	432,659	8,327,822	79.4	2,157,497	1,553,214	1,514,474	2,343,859

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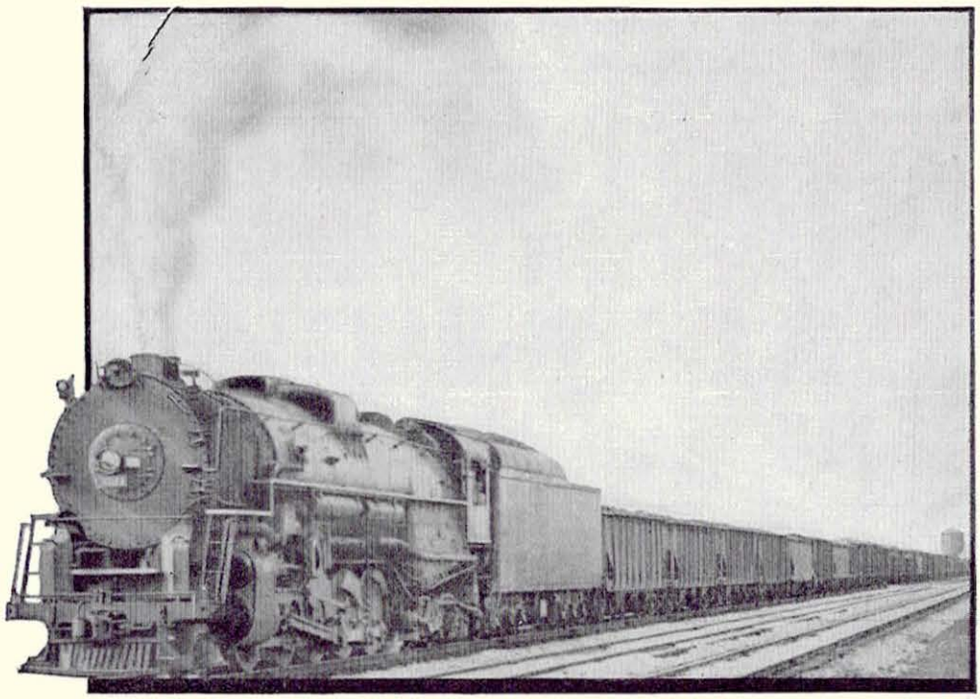

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Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
Georgia Southern & Florida	August	397	$165,859	$23,816	$206,360	$47,874	$53,204	$1,569	$78,885	$2,285	$185,948	90.1	$20,412	—$1,477	$8,567	$43,217
	8 mos.	397	1,552,592	384,209	2,103,122	443,376	491,353	16,756	755,714	21,877	1,764,714	83.9	338,408	175,614	158,348	253,813
New Orleans & Northeastern	August	204	214,532	39,484	271,056	46,027	59,643	9,633	93,365	13,426	224,546	82.8	46,510	8,033	—7,982	3,673
	8 mos.	204	1,706,171	282,964	2,145,971	400,017	509,975	75,914	827,985	112,078	1,945,478	90.7	200,493	—113,542	—283,792	154,054
Northen Alabama	August	110	42,616	1,184	45,501	9,906	1,324	1,213	18,441	2,671	33,529	73.7	11,972	6,443	—7,848	—11,365
	8 mos.	110	423,357	15,769	455,916	123,412	19,460	13,624	176,478	22,213	355,161	77.9	100,755	56,511	—58,746	20,895
Southern Pacific	August	9,114	8,661,631	2,309,229	12,060,857	1,373,337	1,877,035	335,988	4,300,506	566,413	8,720,031	72.3	3,340,826	2,177,806	1,971,905	3,752,061
	8 mos.	9,123	73,505,996	19,291,489	101,945,878	12,338,934	17,280,209	2,891,836	36,084,745	4,829,545	75,403,662	74.0	26,542,216	17,214,322	13,881,399	21,279,126
So. Pacific S. S. Lines	August	....	414,833	60,085	514,079	16,619	128,125	17,593	375,673	31,797	569,807	110.8	—55,728	—56,130	—56,262	30,648
	8 mos.	....	3,663,002	360,529	4,311,525	160,101	1,166,586	162,002	3,222,373	256,255	4,967,316	115.2	—655,791	—666,680	—667,421	—346,846
Texas & New Orleans	August	4,700	3,195,648	462,657	4,061,764	531,626	705,407	143,002	1,295,577	224,363	2,918,773	71.9	1,142,991	854,864	659,131	1,123,787
	8 mos.	4,700	24,746,496	3,979,938	32,022,630	5,078,741	6,124,246	1,281,089	11,500,919	1,871,634	25,964,498	81.1	6,058,132	3,951,524	1,919,868	4,038,525
Spokane, Portland & Seattle	August	555	480,150	69,572	598,928	81,336	66,039	11,718	172,537	23,944	357,036	59.6	241,892	153,607	139,982	177,654
	8 mos.	555	3,385,633	449,786	4,215,844	480,703	616,867	94,346	1,361,553	184,078	2,752,488	65.3	1,463,356	768,704	709,925	803,832
Tennessee Central	August	295	203,330	7,553	219,656	41,945	33,452	7,934	78,449	13,227	174,287	79.3	45,369	39,850	23,650	39,822
	8 mos.	295	1,659,645	64,348	1,806,673	354,323	297,245	67,962	665,638	109,494	1,491,349	82.5	315,324	270,278	144,555	233,483
Terminal R. R. Assn. of St. L.	August	55	.....	.....	669,276	75,402	59,200	3,987	312,727	21,058	475,173	71.0	194,103	110,734	180,677	235,355
	8 mos.	55	.....	.....	5,509,125	740,670	531,471	30,782	2,665,232	180,625	4,172,578	75.7	1,336,547	602,846	1,213,959	1,640,614
Texas & Pacific	August	1,950	1,954,733	282,833	2,446,047	297,717	434,928	79,324	750,448	111,663	1,691,958	69.2	754,089	638,537	472,571	585,346
	8 mos.	1,951	17,058,721	2,328,457	21,099,913	2,512,474	3,422,575	640,012	6,633,809	927,027	14,268,931	67.6	6,830,982	5,705,481	4,090,936	4,688,555
Texas Mexican	August	162	62,527	1,568	69,211	15,972	12,658	3,097	30,372	6,963	68,814	99.4	397	—4,636	—8,537	14,424
	8 mos.	162	536,792	13,878	642,687	125,620	123,366	27,250	294,403	60,866	627,318	97.8	15,369	—24,769	—71,535	11,178
Toledo, Penna. & Western	August	239	155,113	81	157,694	37,767	11,328	14,981	51,353	8,928	124,357	78.9	33,337	27,805	18,257	56,720
	8 mos.	239	1,089,011	824	1,112,115	209,562	105,634	117,727	390,592	72,740	896,255	80.6	215,860	176,774	118,105	156,100
Toledo Terminal	August	28	.....	.....	75,891	12,337	12,124	553	32,158	4,579	61,751	81.3	14,140	—1,303	20,817	28,429
	8 mos.	28	.....	.....	697,705	111,476	108,237	4,640	294,214	39,487	557,993	80.0	139,712	25,182	221,382	179,580
Ulster & Delaware	August	128	27,845	36,649	99,878	16,621	10,529	1,061	52,806	3,445	84,462	84.6	15,416	6,403	2,269	13,582
	8 mos.	128	242,652	94,622	637,142	124,161	96,423	9,039	320,544	30,268	580,435	91.1	56,707	8,094	—12,296	30,010
Union R. R. of Penna.	August	45	.....	.....	450,661	48,771	125,051	158	166,274	13,846	354,100	78.6	96,561	88,561	133,950	385,782
	8 mos.	45	.....	.....	3,620,392	625,439	1,120,148	1,200	1,714,684	114,437	3,575,942	98.8	44,450	—34,528	382,102	1,783,941
Union Pacific	August	3,768	6,189,564	943,525	7,816,862	834,983	1,521,677	158,875	2,258,544	336,458	5,250,711	67.2	2,566,151	1,977,130	1,611,078	3,527,265
	8 mos.	3,765	46,879,808	6,683,049	59,073,176	7,098,560	13,304,996	1,390,648	17,638,517	2,756,665	43,249,452	73.2	15,823,724	10,892,637	8,764,937	12,843,249
Oregon Short Line	August	2,531	1,877,686	213,246	2,254,991	409,799	302,359	48,799	736,323	122,375	1,656,332	73.5	598,659	333,040	260,774	420,073
	8 mos.	2,531	14,861,880	1,547,341	17,876,603	3,179,938	3,047,949	430,978	5,764,533	1,011,123	13,820,813	77.3	4,055,790	1,792,917	1,057,439	2,142,127
Oregon-Wash. R. R. & Nav. Co.	August	2,337	1,471,629	150,357	1,795,704	264,597	213,375	71,093	646,429	118,856	1,329,723	74.1	465,981	282,488	182,262	350,275
	8 mos.	2,337	10,650,092	1,192,417	13,300,659	2,570,921	2,017,858	574,340	5,296,356	988,964	11,586,997	87.1	1,713,662	243,372	—585,318	286,055
Los Angeles & Salt Lake	August	1,249	1,017,076	291,868	1,460,359	237,451	200,886	68,856	505,244	83,455	1,157,400	79.3	302,959	150,919	32,952	231,887
	8 mos.	1,246	9,601,007	2,089,933	12,886,438	2,220,539	2,093,265	590,959	4,226,251	684,095	10,251,163	79.6	2,635,275	1,451,862	446,649	1,447,517
St. Joseph & Grand Island	August	258	248,320	5,463	265,370	34,488	32,478	3,626	93,161	17,083	181,142	68.3	84,228	71,408	41,385	85,910
	8 mos.	258	1,987,687	38,837	2,116,744	439,191	271,583	27,734	698,591	141,077	1,591,684	75.2	525,060	400,625	181,602	377,976
Utah	August	111	71,171	.....	71,319	12,477	23,311	336	16,836	5,529	58,489	82.0	12,830	6,644	—3,725	—8,339
	8 mos.	111	703,891	36	707,571	109,516	222,117	2,959	174,931	44,153	552,720	78.1	154,851	98,873	10,381	31,232
Virginian	August	601	1,287,067	17,709	1,379,667	132,696	191,339	16,116	281,626	33,550	654,297	47.4	725,370	555,370	631,662	627,960
	8 mos.	587	9,489,916	116,128	10,193,642	1,051,661	1,891,832	124,756	2,255,719	257,706	5,581,731	54.8	4,611,911	3,386,840	3,955,247	4,642,014
Wabash	August	2,523	3,800,244	334,820	4,420,498	713,213	792,747	207,180	1,853,163	243,177	3,833,274	86.7	587,224	345,582	—110,443	638,079
	8 mos.	2,523	29,536,203	2,788,689	34,842,634	3,346,925	6,185,346	1,560,292	15,400,286	1,838,294	28,498,948	81.8	6,343,686	4,641,299	1,349,615	4,676,670
Ann Arbor	August	293	306,234	7,755	334,188	44,986	72,955	15,304	151,266	14,261	299,390	89.6	34,798	12,546	—6,207	56,228
	8 mos.	293	2,627,666	49,293	2,779,699	257,941	564,799	120,699	1,287,410	133,176	2,364,956	85.1	414,743	238,710	54,823	327,286
Western Maryland	August	891	1,166,016	15,242	1,245,610	184,486	237,201	39,832	324,872	38,239	830,821	66.7	414,789	334,789	347,645	461,066
	8 mos.	893	9,513,930	90,636	10,114,005	1,411,512	1,796,015	354,565	2,757,119	335,449	6,685,703	66.1	3,428,302	2,818,302	2,869,337	3,517,052
Western Pacific	August	1,051	1,002,486	109,026	1,194,856	152,208	167,522	67,301	465,054	46,254	918,072	76.8	276,784	182,718	178,702	367,144
	8 mos.	1,051	7,046,293	588,821	8,306,992	1,631,123	1,583,709	553,447	3,640,816	389,564	7,962,063	95.8	344,929	—397,168	—333,033	30,957
Wheeling & Lake Erie	August	511	1,039,676	8,484	1,131,342	167,929	243,711	32,437	357,782	39,652	842,299	74.5	289,043	183,775	173,675	293,197
	8 mos.	511	7,662,604	78,121	8,245,843	1,009,748	2,137,202	275,638	2,703,793	324,789	6,459,253	78.3	1,786,590	958,155	917,486	2,557,719
Wichita Falls & Southern	August	203	74,249	65	75,758	11,636	7,979	2,361	17,538	3,515	42,629	56.27	33,129	28,924	24,331	7,083
	8 mos.	203	444,612	796	460,159	88,418	67,991	19,523	146,758	28,360	347,651	75.55	112,508	77,651	43,920	86,760

News Department Continued on Next Left Hand Page

WHY?...

SHOULD SWITCHERS BE "STEP-CHILDREN"

Build a new road engine, and you incorporate modern improvements such as "Limited Cut-Off" and The Locomotive Booster as a matter of course.

A dollar earned in the yards is just as good as a dollar earned on the road. So treat new switch engine designs with the same respect you accord a road engine.

On switch engines the Limited Cut-Off has proved in service that it will save up to 30% in fuel.

Team it up with The Locomotive Booster and have a modern switch engine that will handle economically and speedily the loads that modern road engines bring into the yards.

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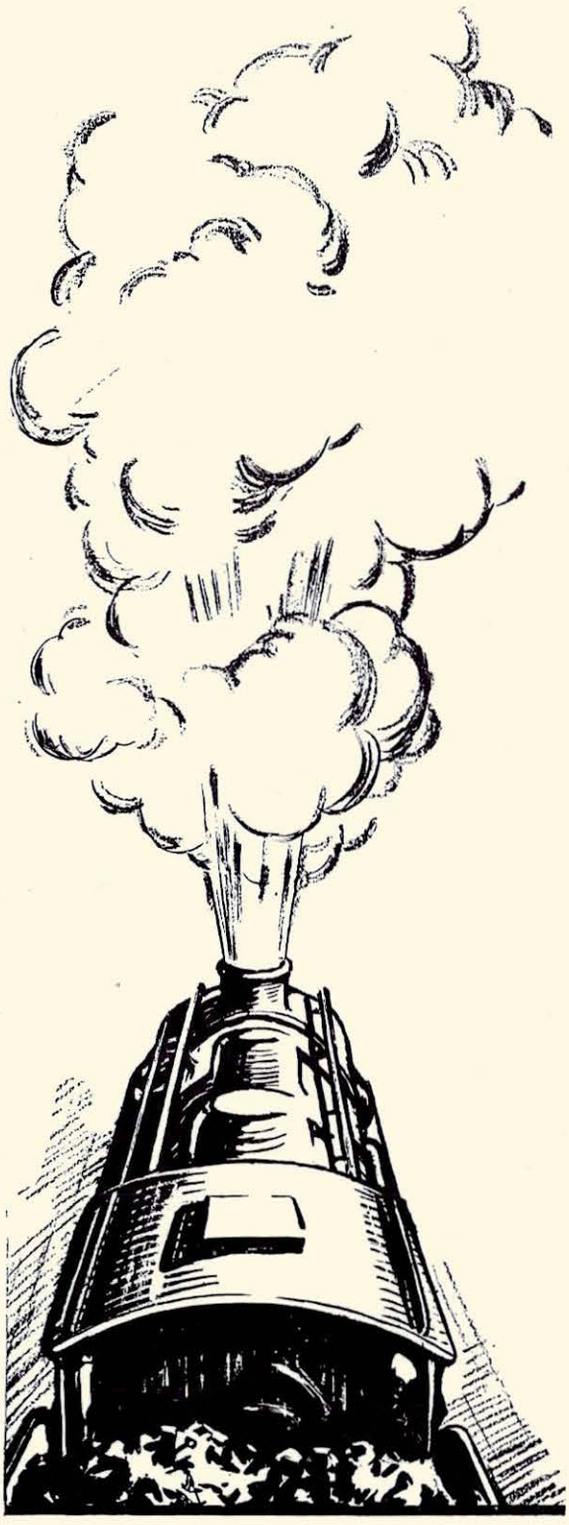
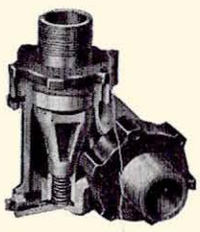


FRANKLIN RAILWAY SUPPLY COMPANY

Incorporated

NEW YORK ST. LOUIS CHICAGO
SAN FRANCISCO MONTREAL



THE FRANKLIN SLEEVE JOINT...

A reliable conduit, free from limitations in movement, permitting short vertical pipes and greater rail clearance.

NEWS

(Continued from page 565)

thrust under your nose as regularly as your morning paper or your coffee. If the figures showed that the railroads were sick you would promptly change the diet and the hygiene. I submit that this would be an improvement over the present system or lack of system, under which we wait till the patient is gasping for breath and then have a civil war over the question: Shall we use the pulmotor?"

New England Business Organizations Divide on Railroad Future

Of the 73 New England business organizations which have formally reported to the New England Council their findings on the report of the New England Governors' Railroad Committee, 40 support the "majority report" of that Committee which called for a consolidation of the New York, New Haven & Hartford and Boston & Maine under certain conditions; 22 support the "minority report," calling for trunk line affiliations for New England roads; and 11 either had no opinion, could not agree, or favored some plan not covered in the Railroad Committee's report.

This summary to date of the Council's poll of New England business organizations was made public at the Council's twenty-fourth quarterly meeting, just held. A total of 296 organizations has undertaken to study the Governors' Railroad Committee report through committees appointed especially for the purpose.

Among the reporting organizations are two national organizations with an interest in New England, five New England wide organizations and 19 state organizations. The remaining 47 organizations represent cities or towns in New England.

A summary of the opinions of the reporting organizations follows:

	Support Majority	Support Minority	Some other plan or no opinion
National organizations	1	1	
New England organizations	2	1	2
Maine "	6		1
New Hampshire "	6	2	5
Vermont "	1	1	
Massachusetts "	9	8	2
Rhode Island "	1	7	
Connecticut "	14	2	1
Total	40	22	11

Harriman Bank Appeals to Employees

The Harriman National Bank and Trust Company of New York, in an advertisement published in New York newspapers and widely distributed in leaflet form throughout the country, has appealed to railway employees under the heading "Labor's Great Opportunity!" as follows:

"Are the leaders of railroad labor alive to the present situation? Do they realize what a great gesture on their part, by voting a like amount in wage reduction and matching whatever increase in freight rates may be forthcoming, means? Scan the following figures compiled by Brooks Earning Indicator, and note the credit labor can bring to railroads and, incidentally, to themselves in increased employment; also the favorable reflection by the public on labor organizations themselves, by such voluntary action. Is labor big enough? It costs labor nothing—the increased value of the dollar offsets the 'sacrifice.'"

	10% Freight Increase	10% Wage Reduction	Total Revenue to R. R. per share
Atchison, Topeka & Santa Fe	$7.26	$4.16	$11.42
Atlantic Coast Line	5.62	3.41	9.03
Baltimore & Ohio	6.76	3.59	10.35
Boston & Maine	11.44	7.82	19.26
Chesapeake & Ohio	1.64	.79	2.43
Chicago & North Western	6.04	3.65	9.69
Chicago Great Western (pfd.)	4.14	2.17	6.31
"St. Paul" (pfd.)	9.68	5.33	15.01
Rock Island	12.92	7.38	20.30
Delaware & Hudson	6.34	3.27	9.61
Delaware, Lackawanna & Western	3.00	1.83	4.83
Erie	5.92	3.21	9.13
Great Northern (pfd.)	3.44	1.88	5.32
Gulf, Mobile & Northern	3.96	1.95	5.91
Illinois Central	8.62	4.87	13.49
Kansas City Southern	5.42	2.84	8.26
Lehigh Valley	4.14	2.23	6.37
Louisville & Nashville	7.98	4.28	12.26
Missouri-Kansas-Texas Lines	4.54	2.53	7.07
Missouri Pacific	12.04	6.47	18.51
New York Central	6.14	4.27	10.41
New York, Chicago & St. Louis	12.66	6.15	18.81
New York, New Haven & Hartford	4.00	3.37	7.37
New York, Ontario & Western	1.24	.80	2.04
Norfolk & Western	6.64	3.19	9.83
Northern Pacific	2.62	1.45	4.07
Pennsylvania	3.02	1.94	4.96
Pere Marquette	7.26	3.68	10.94
Reading	5.30	2.76	8.06
St. Louis-San Francisco	9.06	5.05	14.11
St. Louis Southwestern	11.34	5.70	17.04
Southern Pacific	5.18	3.09	8.27
Southern Railway	7.06	4.07	11.13
Texas Pacific	7.80	4.31	12.11
Union Pacific	6.82	3.80	10.62
Wabash	7.82	4.14	11.96
Western Maryland	3.12	1.49	4.61

Suspend Construction on C. N. R. Montreal Terminal

Postponement for the present of further expenditure upon the Montreal terminal plans of the Canadian National has been decided upon after careful consideration and after conference with the government, according to a statement issued last week-end in Montreal by Sir Henry Thornton, chairman and president of the Canadian National.

The statement follows:

"In view of the very serious decrease in railway revenues, due to the depression in world trade, which has equally affected all railways on the North American Continent, the Canadian National Railway management has of necessity been giving very serious consideration to the curtailment of expenditures in every possible direction. It is now apparent that the railway will be able to provide from earnings little, if any, towards the fifty-seven millions required to meet interest charges. In addition, there are other large expenditures necessary to the operation of the railway itself to be provided for during the current year. In view of this, and the unsettled state of international financing, the management, after careful consideration and after conference with the Government, has decided to postpone for the present further expenditures upon the Montreal terminal plans of the railway. The management takes this step with regret, but considers it necessary in view of the unprecedented demands of the general situation. It does not mean that the work will be closed down entirely as there are certain features now in course of construction that will require to be completed. This will continue to provide employment for a considerable number of men for some time to come. Meanwhile, the management wishes to point out that the present action involves suspension only and we are looking forward to the time when a general improvement of business and the stabilizing of the financial situation will allow us to complete the plans which we have in view."

Railroad Credit Position Serious, Says Fairman Dick

Fairman R. Dick of Roosevelt & Son, bankers, addressed the convention of the American Bankers Association at Atlantic City on October 5. He emphasized the necessity of maintaining railroad credit and stated that it was now non-existant. Discussing competition, he said, in part:

"Truck competition depends more on convenience and character of service than on line-haul cost. Truck competition does not seem to vary in different parts of the country in accordance with the rate structure there. It seems to be regarded just as seriously in the Eastern District as in the New England Region where, on account of the high character of the traffic and the short hauls, the rates charged are substantially higher; in fact, New England would seem to be the clearest refutation of the charge that the trucks can destroy the railroads, for in New England not only is the traffic high-class in quality, with high rates, but the auls are short, and the roads are excellent. The carriers should develop, as far as is economically possible, a service comparable in convenience to that of the trucks. Where the conditions are such that this cannot be done, then that field should be given over to the trucks.

"The development of river and canal transportation has proceeded to a point where it is economically unsound. Uneconomical waterways do not reduce, but increase, total transportation costs. Sound bookkeeping reveals direct losses to the government. In addition, when the Governmental authorities order the railroads to short-haul themselves, railroad unit costs are increased on account of reduced volume, and sound regulation would seem to require that every order issued to the railroads to short-haul themselves should be accompanied by an increase in rates on some part of their traffic, in order to maintain necessary revenues.

"A difficulty of the railroads which cannot be immediately corrected, is taxation. From 1916 to 1929, taxes increased from $157,000,000 to $397,000,000, or 153 per cent. To this large increase of taxation must be added a large sum for indirect taxation, such as the cost of eliminating grade crossings and branch-line service operated at a loss. Taking the country

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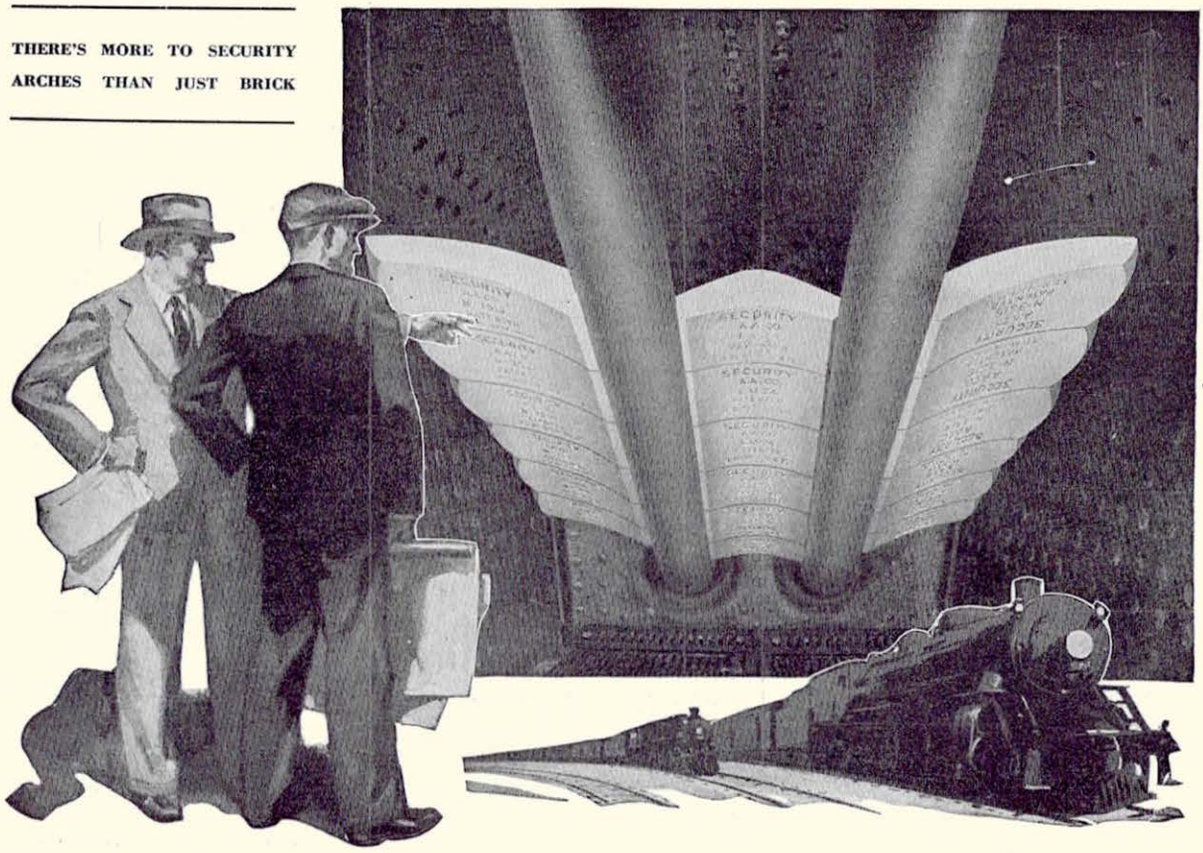
THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK



Only A Complete Arch Will Give Full Economy

EVEN a single missing Arch Brick will seriously affect the economy and efficiency of Arch performance.

In these days, when every penny must be made to count, be sure that your locomotive Arches are fully equipped to save every possible pound of fuel.

In the interests of economy, not a single locomotive should be permitted to leave the roundhouse without every brick in place.

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
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Locomotive Combustion Specialists » » »

as a whole, there are very many branch lines where a minimum of passenger service, in conjunction with mail and milk service, etc., must be rendered for the convenience of the local community. The loss on this service comes directly out of the earnings of the carriers, and there is nobody now who can be billed. As far as possible, the railroads are eliminating these services, but there is a minimum beyond which they cannot proceed without hardship to their local communities. Whenever, in the search for economy, the railroads have gone beyond this minimum, they are promptly reminded of it by the State Commission or by the Interstate Commerce Commission."

Discussing the effect of high rates with low commodity prices, he said:

"For many years preceding the decline of commodity prices following the war, the relationship of freight rates and commodity prices had been increasingly favorable for broad distribution of goods. Taking 1890 as a start, and reducing rates and prices to a base of 100, by 1919 commodities had advanced to 247, while revenues per ton-mile had advanced only to 105. This continued reduction of the cost of transportation in relation to commodity prices was a great stimulant to the transport of traffic for long distances. The present depression has now changed the relationship for the worse. If commodities stay at the present level and rates are increased 15 per cent, the relationship between the two would be almost back to 1890. Therefore, if commodities stay at these depressed levels the movement of traffic cannot be as free as it was for the last 15 or 20 years. This would result in what is known as a 'drying up' of traffic, as compared with a diversion of traffic. It is evident that if commodities fail to rise from their present depressed levels, railroad costs will be materially reduced, and thus make possible a reduction in freight rates."

The collapse of railroad credit, however, rather than any of these difficulties, is the principal railway problem, in Mr. Dick's opinion. "If the flow of capital to the railroads be terminated," he said, "the end is only a question of time. At the present time the inflow has ceased, from a practical standpoint—*absolutely*. So serious has been the destruction of railroad values, that not only is there great danger to our general economic structure, but there is serious doubt as to the future flow of capital into the railroad industry. It is believed by some that when business improves and earnings improve, that in time, credit will be restored. I do not believe this is necessarily true. It is evident that the nature of the railroad industry is such that as between times of prosperity and depression, large fluctuations in earnings are unavoidable. For credit to be stabilized, therefore, earnings must be sufficient in normal times."

Mr. Dick felt that "Definite tangible steps should be taken, immediately following the decision in the rate case, to speed up and make certain the correction of these faults in the railroad structure." He suggested a national council consisting of three members of the Interstate Commerce Commission, three members from the railroads, the chairmen of the committees on interstate commerce of the Senate and the House, the Secretary of the Treasury and the head of the Federal Reserve Board. This council, he said, should proceed at once to the analysis of the problem and the decision as to what steps should be immediately taken for correction.

Equipment and Supplies

FREIGHT CARS

THE CONTINENTAL OIL COMPANY has ordered 30 tank cars of 6,000 gal. capacity from the Pressed Steel Car Company.

PASSENGER CARS

THE FONDA, JOHNSTOWN & GLOVERSVILLE has ordered five interurban cars from the J. G. Brill Company. Inquiry for this equipment was reported in the *Railway Age* of July 18.

THE ATCHISON, TOPEKA & SANTA FE has ordered one articulated type, gas-electric rail motor car from the Pullman Car & Manufacturing Corporation. The car will contain a 900-hp. Electro-Motive Company power plant.

THE MISSOURI - KANSAS - TEXAS has ordered two gas-electric rail motor cars from the St. Louis Car Company. In the *Railway Age* of July 25 this company was reported as inquiring for one baggage and mail gas-electric rail motor car.

IRON & STEEL

THE WABASH has ordered 130 tons of structural steel for a bridge at Conception, Mo., from Stupp Brothers Bridge & Iron Co.

THE READING COMPANY has ordered from the American Bridge Company 200 tons of steel for a bridge at East Logan street, Fishers Station, Philadelphia, Pa., on the Germantown and Chestnut Hill branch.

THE WESTERN MARYLAND has ordered 108 tons of steel for a bridge over the Cheat river at Cheat Junction, W. Va., from the American Bridge Company, and 109 tons for a bridge near Thurmont, Md., from the McClintic-Marshall Corporation.

MOTOR COACHES

THE RICHMOND-GREYHOUND LINES, affiliated with the Richmond, Fredericksburg & Potomac, have received two Type 250, 33-passenger observation Yellow coaches from the General Motors Truck Company.

THE BURLINGTON TRANSPORTATION COMPANY, a subsidiary of the Chicago, Burlington & Quincy, has received one Type V, 29-passenger observation Yellow coach from the General Motors Truck Company, Pontiac, Mich.

Supply Trade

George H. Malony has been elected secretary of **Whitman & Barnes, Inc.,** Detroit, Mich., to succeed **J. I. Holton,** resigned.

H. W. Dillon has been appointed sales manager of the **Gold Car Heating & Lighting Company,** with headquarters at Brooklyn, N. Y.

Thomas P. Cook has been appointed New England representative, with headquarters at Bridgeport, Conn., of the **Signal Accessories Corporation,** Utica, N. Y.

Charles O. Guernsey, who has been connected with the Brill organization since 1923, has been appointed chief engineer of the **J. G. Brill Company,** Philadelphia, Pa., and its subsidiary companies.

William T. Bentz has been appointed manager of sales of rail steel products, of the **Republic Steel Corporation,** Youngstown, Ohio. Mr. Bentz was formerly sales head of Steel & Tubes, Inc., a subsidiary of the Republic Steel Corporation. He will continue for the present to have his headquarters at Cleveland, Ohio.

Charles H. Gayetty, who has been appointed manager of railroad sales of the **Keasbey & Mattison Company,** Ambler, Pa., was born at Oil City, Pa. He was educated in the high schools of his native city and also attended Temple University, Philadelphia, Pa. He began railway work in the operating department of the Pennsylvania at Oil City, and subsequently served in the general freight department of the same road at its Broad Street Station, Philadelphia, remaining with the Pennsylvania for a total period of 11 years. Mr. Gayetty subsequently was in charge of sales of the railroad department of the Quaker City Rubber Company, Philadelphia. For the past five years he has been with the railroad department of the Boston Woven Hose & Rubber Company, Boston, Mass., and now becomes manager of railroad sales for the Keasbey & Mattison Company. Mr. Gayetty has been active at the conventions of the American Railway Association, held at Atlantic City, N. J., having served as chairman of the enrollment committee; and also,

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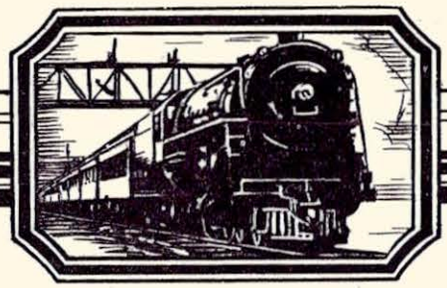

Alco Alco

TO ECONOMIZE— MODERNIZE

According to the Annual Statistical number of the Railway Age, the railroads of this country ordered 734 new locomotives in 1927. In 1928 and 1929 new orders amounted to 603 and 1212 respectively. In 1930 they dropped to 440 and in 1931 new orders are practically nil.

In other words, the average new locomotive orders per year for the last five years will approximate 600.

Knowing that there are practically 58,000 locomotives on the main lines of this country; knowing that 80 per cent of them are now over ten years old, and also that 45 per cent are over twenty years old; and using the replacement rate of 600 per year, the average for the past five years; how old will some of the engines running today have to be before they are all replaced?

And how efficient will they be in view of the fact that the modern engine of today is admittedly efficient enough to make many engines from five to ten years old practically obsolete?

American Locomotive Company
30 Church Street New York N.Y.

Alco Alco

at a number of the conventions, as a member of the executive committee of

Charles H. Gayetty

the Railway Supply Manufacturers' Association.

F. J. Griffiths has joined The Timken organization at Canton, Ohio, and has been elected director and president of **The Timken Steel & Tube Company. M. T. Lothrop,** president of **The Timken Roller Bearing Company,** has been made chairman of the board of The Timken Steel & Tube Company. Mr. Griffiths has been identified with the steel industry for 30 years. Until recently he was associated with the Republic Steel Corporation as president of the Republic Research Corporation. Mr. Griffiths began his career in the steel industry with The United Steel Company at Canton, and later helped to organize The Central Steel Company, Massillon, Ohio, of which he was president and general manager. When these two companies were merged to form The Central Alloy Steel Company, he was chosen chairman of the board, which office he held

F. J. Griffiths

until the Central Alloy was merged with the Republic Steel Corporation.

OBITUARY

F. A. Boeye, vice-president and general sales manager, with headquarters at New York, of the North American Cement Corporation, Albany, died on October 3 at his home in New York, at the age of 47.

TRADE PUBLICATION

RAILROAD CALCYANIDE.—The Calcyanide Company, New York, has issued three folders, known as Forms A, B and C, each of which discusses a different aspect of the problem of vermin destruction on railroads and the application thereto of Railroad Calcyanide. A description of this product, the thorough manner in which it operates to kill vermin of all kinds and the advantages of its use through increased employee efficiency are some of the subjects discussed.

Foreign

Percy J. Pybus New British Minister of Transport

Percy J. Pybus has been appointed minister of transport of Great Britain in the new National government recently formed under Prime Minister J. Ramsay MacDonald, former Labor government head. Mr. Pybus is chairman of the Power & Traction Finance Company, Ltd., a vice-president of the British Electrical & Allied Manufacturers Association and a director of the English Electric Company, Ltd.

He has been a Liberal member of Parliament since 1929, and succeeds, in the transport ministry, Herbert Morrison, who was among the several former Labor cabinet members who failed to join Prime Minister MacDonald in the coalition ministry.

Light Freight Trains for Short Haul Traffic

The German National Railroad Company has been effecting important economies in the speeding-up of short-haul merhandise freight service by the operation of light freight trains, according to an article in a recent issue of Modern Transport (London). The trains are known as "Leig" trains and consist of two freight cars and a brake van, drawn by a steam locomotive.

As a result of the operation of these trains, the article points out, the average speed on the lines involved has been increased from six to 14 m. p. h. The handling of short-haul parcel and merchandise traffic in this manner has also eliminated delays to regular freight trains on which it was formerly handled. The success attending the operation has induced the German railway to make experiments in the use of rail motor cars in which merchandise freight traffic is handled in accordance with the same plan.

Construction

ATCHISON, TOPEKA & SANTA FE.—This road plans to commence construction of the remaining portion of its line between Amarillo, Tex., and Las Animas, Colo., by the end of the year. That part of the line between Amarillo and Boise City, Okla., 121.5 mile, was completed some time ago. The remaining section will extend from Boise City to Las Animas by way of Springfield, Colo., a distance of about 113 miles. The line is to be completed by January 1, 1934.

BOSTON & MAINE.—A contract for the installation of concrete work required in the rebuilding of bridge 28.53 (old A41), Ipswich, Mass., has been let to Fred T. Ley & Company, Springfield, Mass. The contract for the erection of the steel superstructure of this bridge has been awarded to the Boston Bridge Works, Cambridge, Mass. The total amount involved in the reconstruction is about $40,000.

CHESAPEAKE & OHIO.—This company has awarded to Guy Feagans, Ashland, Ky., a contract for the waterproofing of 21 bridges between Marshall and Columbus, Ohio, at an approximate cost of $178,500, and to the West Virginia Construction Company, Huntington, W. Va., a contract for the construction of an undergrade crossing, to cost about $31,000 at Midland, Ky. Authorization for the former project was previously reported in *Railway Age.*

CHICAGO & NORTH WESTERN.—The M. E. White Company, Chicago, has been awarded a contract for the construction of the substructure of a highway subway to carry State Highway 100 under the tracks of this company a short distance west of West Allis, Wis.

CHICAGO, BURLINGTON & QUINCY.—This road expects to ask for bids in about a week for the reconstruction of its coach shop at Aurora, Ill., which was recently destroyed by fire.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—This road will receive bids in the near future for the construction of a highway subway to carry State Trunk Highway No. 33 under its tracks near Neda, Wis. The subway proper has an estimated cost of about $15,000, while the total cost of the project, including the highway approaches, will be approximately $75,000.

DELAWARE & HUDSON.—The New York Public Service Commission has approved contract plans, specifications and an estimate of cost for the elimination of grade crossings of this company's tracks at Broadway, Madison avenue, and South Ferry, Arch, Rensselaer, Mulberry, Schuyler and Church streets, all in Albany, N. Y.

ERIE.—This road has asked for bids for the construction of a subway to carry

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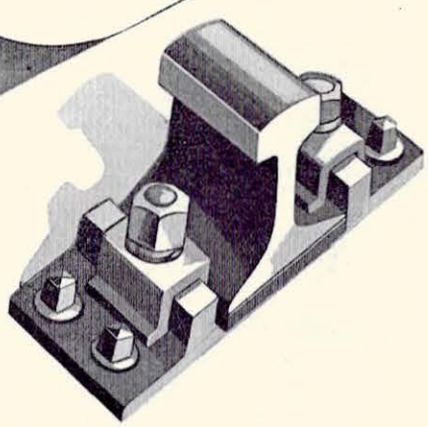
BETTER SERVICE

and then...

GEO



"SERVICE, better service, that's what we must give the public. We can't take the public by the nape of the neck and force it to ride. We can only give it such courteous and fair treatment that it will want to ride with us." These are the recently reported words of a prominent railroad president.

G E O Track Construction is the logical step to provide that better service. Passenger appeal and riding comfort begin at the track. G E O assures smooth and practically noiseless track and permits greater speed with greater safety. Yet G E O has many other points of superiority. Longer life of rails and ties, reduced maintenance costs, control of rail movement, reduction in rail wave motion . . these advantages maintenance of way men cannot afford to overlook.

Descriptive literature will be sent at your request and Carnegie engineers are ready at all times to cooperate with you.

CARNEGIE STEEL COMPANY - PITTSBURGH

Subsidiary of United States Steel Corporation

156

GEO TRACK CONSTRUCTION

Tipton street under its tracks, at Huntington, Ind., at a cost of about $73,000. It is expected that the contracts will be awarded about October 15.

NEW ORLEANS PUBLIC BELT.—A contract for the construction of the piers for the main spans of the Public Belt combined railroad and highway bridge over the Mississippi river at New Orleans, La., has been awarded to Siems-Helmers, Inc., St. Paul, Minn., at a cost of $3,083,185, while the contract for the construction of the substructure for the approaches has been awarded to the MacDonald Engineering Company, Chicago, at a cost of about $500,000.

NEW YORK CENTRAL.—The New York Public Service Commission has ordered the reconstruction of the railroad bridge carrying this company's tracks over the Mohawk Golf Club—Aqueduct county highway in Niskayuna, N. Y. The work involves the construction of a new undercrossing 140 ft. east of the present structure.

NEW YORK CENTRAL.—In connection with its West Side improvement program, this company has awarded to the Frederick Snare Corporation of New York City a contract for the placing of foundations for Warehouse 802, Washington street, New York. Contracts have also been awarded to Edward J. Duffy Company, Inc., New York, for the construction of an office building on Pier K, Weehawken, N. J., and for viaduct paving, curbs, etc., at the easterly end of the 241st Street viaduct, Wakefield, N. Y. An additional contract has been awarded to James A. Meenan, Inc., New York, for the construction of signal stations CD and CR at Croton and Harmon, N. Y., respectively.

OREGON-WASHINGTON RAILROAD & NAVIGATION CO.—A contract has been awarded to the Parker-Schram Company, Portland, Ore., for the construction of an extension to the second floor of this company's offices on the Ainsworth dock at Portland. The estimated cost of this work is about $28,000.

PENNSYLVANIA.—A contract amounting to $35,000 has been awarded by this railroad to the Ferguson & Edmondson Company, Pittsburgh, Pa., for the construction of an overhead bridge and approaches and a change of line in the Pennsylvania tracks at the Osborne crossing of its Chautauqua branch, Buffalo division, about one mile south of Sherman station, Sherman, N. Y.

PUBLIC SERVICE COMMISSION OF NEW YORK.—The New York Public Service Commission has approved detailed plans, specifications and estimates of cost amounting to approximately $1,000,000 in connection with the elimination of grade crossings of various railroads at Austin, Amherst, Tonawanda and other streets in Buffalo, N. Y.

WESTERN MARYLAND.—This company plans to undertake the reconstruction of a bridge consisting of two 80-ft. spans over the Cheat river at Cheat Junction, W. Va., and of another bridge consisting of one 80-ft. and one 66-ft. span near Thurmont, Md. Steel required for this work has been ordered from the American Bridge Company and the McClintic-Marshall Corporation.

Financial

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Fairmount, Neb., to McCool Junction, 6.88 miles.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue nominally $10,500,000 of refunding mortgage 4½ per cent series C bonds in reimbursement for capital expenditures—$6,000,000 of these bonds to be pledged and repledged as security for short term loans.

PITTSBURGH & WEST VIRGINIA.—*Final Valuation.*—The Interstate Commerce Commission has issued a final valuation report as of 1917 finding the final value for rate-making purposes of the property owned and used for common-carrier purposes to be $23,682,328. The final value of the West Side Belt was placed at $5,050,537.

PITTSBURGH & WEST VIRGINIA.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its line in Pittsburgh, Pa., between West Belt Junction and Liberty avenue and Duquesne Way, 1.45 miles, including its station, bridges and a tunnel. The property is to be sold to Allegheny county for highway purposes.

SOUTHERN.—*Abandonment.*—This company and the Sievern & Knoxville have applied to the Interstate Commerce Commission for authority to abandon the line from Sievern, S. C., to Batesburg, 17.38 miles, and to abandon the operation of the line from Sievern to Perry, 7.74 miles.

SOUTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and the Central Pacific to abandon a branch line extending from Filben, Nev., to Candelaria, 5.23 miles.

Dividends Declared

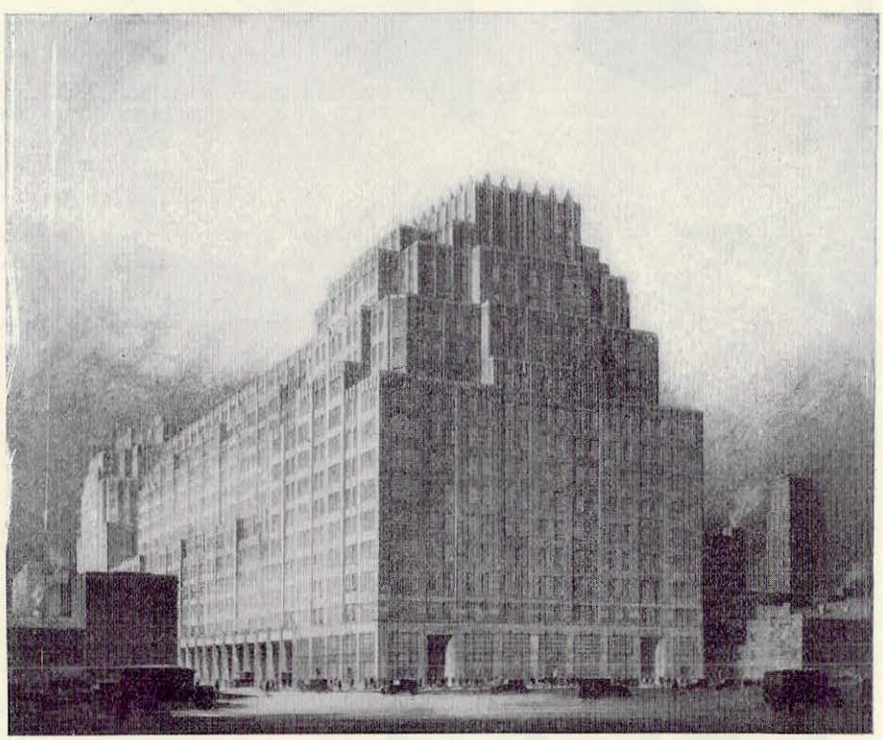
Atchison, Topeka & Santa Fe.—Common, $2.50, quarterly, payable December 1 to holders of record October 30.

Baltimore & Ohio.—Common, 1 per cent, quarterly; Preferred, 1 per cent, quarterly, both payable December 1 to holders of record October 10.

Average Prices of Stocks and of Bonds

	Oct. 6	Last week	Last year
Average price of 20 representative railway stocks..	44.47	47.02	102.88
Average price of 20 representative railway bonds..	77.24	79.18	95.87

* * * *



Architect's Drawing of the Union Inland Freight Terminal, the Largest Building on Manhattan Island, Now Under Construction by the Port of New York Authority, for the Use of All Railroads Serving the Metropolitan Area

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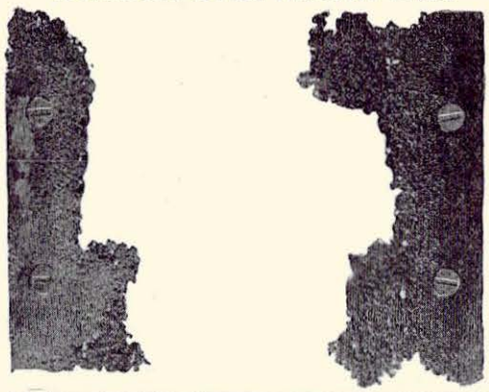
COMMON OPEN HEARTH STEEL



Common O. H. Steel 26. Ga. Galv. Sheet Exposed to weather Six Years.

. . . WHICH would you pick for CAR PLATES?

See what happened to ordinary steel when corrosion went to work.

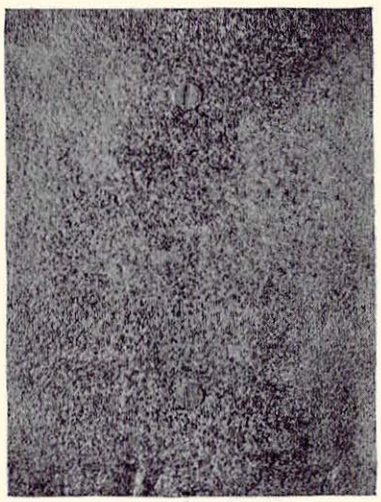
No wonder car designers ordinarily provide a substantial increase in plate thickness to offset the inroads of corrosion.

Now look at the way Toncan Iron resisted the same corrosion that ruined ordinary steel.

Because of the superior resistance to corrosion of this alloy of refined iron, copper and molybdenum, car designers can eliminate the corrosion factor and save a ton in the weight of the average gondola. Or by using the same weight of plate, they can build correspondingly longer life into the cars.

Many thousand cars are proving the value of Toncan Iron for car plates.

TONCAN IRON



Toncan 26. Ga. Galv. Sheet Exposed to weather Six Years.

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

REG. U. S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

C. H. Skinker, Jr., and **J. W. Murphy,** attorneys for the St. Louis-San Francisco, have been promoted to assistant general attorneys, with headquarters as before at St. Louis, Mo.

A. E. Beckett, chief solicitor of the lines of the Canadian National in the province of Quebec, retired effective October 1, and with his retirement the position of chief solicitor for lines in Quebec was abolished, and Mr. Beckett's duties assumed by **Charles A. de L. Harwood.** Mr. Beckett is a native of Sherbrooke, Que. He was called to the bar of Quebec in 1884, and was appointed K.C. in 1897. Mr. Beckett began his railway career in 1891, when he joined the legal department of the Grand Trunk (now part of the C.N.R.) as assistant to the solicitor at Montreal, Que.

Edward M. Carr, who has been appointed general claim agent of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has served in various departments of the Frisco for nearly 35 years. He was born on August 12, 1880, at Tillatoba, Miss., and after a high school education, entered the service of the Kansas City, Memphis & Birmingham (now part of the Frisco), on December 28, 1896. After occupying various clerical positions in the office

Edward M. Carr

of the master mechanic at Memphis, Tenn., as well as serving for a year each as a locomotive fireman and brakeman, Mr. Carr was transferred to the office of the superintendent at Memphis in July, 1904. He served as timekeeper and then as chief clerk in this office until October 1, 1910, when he was transferred to the personal injury claim department at Memphis, as claim agent. On September 17, 1917, he was promoted to district claim agent at Monett, Mo., and on July 24, 1924, he was transferred to Memphis. Mr. Carr was advanced to assistant general claim agent at Springfield on January 9, 1928, which position he retained until his recent promotion, effective September 1.

OPERATING

T. M. Spence, assistant superintendent on the Southern Pacific Lines in Texas and Louisiana, with headquarters at Houston, Tex., has been transferred to the Victoria division, with headquarters at Victoria, Tex., to succeed **P. B. McNeal,** who has retired.

Effective October 1, the Savannah division of the Central of Georgia will comprise the present Savannah division and the Athens district, and **Henry Baldwin** will serve as superintendent. The Macon division will comprise the present southwestern division, to which will be added the Atlanta and Thomaston districts, and Macon terminal, with **M. B. Smith** as superintendent. The Columbus division will comprise the present Columbus division and the present Chattanooga division, and **C. Baldwin** will serve as superintendent.

W. P. Wilson, trainmaster on the Sterling division of the Chicago, Burlington & Quincy, with headquarters at Bridgeport, Neb., has been promoted to assistant superintendent of the Alliance and Sheridan divisions, with headquarters at Sheridan, Wyo. This is a newly-created position made necessary by the abolition of the position of superintendent on the Sheridan division and the extending of the jurisdiction of the superintendent of the Alliance division to include the former division, as noted in the *Railway Age* for October 3. **E. P. Stine,** trainmaster at Sheridan, has been transferred to Bridgeport, to succeed Mr. Wilson. The position of trainmaster at Sheridan has been abolished.

J. D. Farrington, who has been appointed general manager of the Ft. Worth & Denver City and the Wichita Valley (subsidiaries of the Chicago, Burlington & Quincy), with headquarters at Ft. Worth, Tex., as noted in the *Railway Age* for October 3, has been in railroad service for more than 22 years. He was born on January 27, 1891, at St. Paul, Minn., and after a high school education, entered the service of the Great Northern in June, 1909, where he served in the engineering department. A year later he left this road to become a timekeeper on the Chicago, Burlington & Quincy, where he subsequently served as an assistant foreman and foreman in the track department. In 1912, he was promoted to roadmaster and served until 1917 in this capacity and as an assistant trainmaster and trainmaster. In that year he left the railroad to serve in the World War with United States Army, where he was consecutively a lieutenant, a captain and a major. After the war, he returned to the Burlington as assistant superintendent of the Ottumwa division, later serving on the staff of the federal manager of this road. From 1920 to 1922, Mr. Farrington was superintendent on

J. D. Farrington

the Quincy, Omaha & Kansas City (part of the Burlington), with headquarters at Kansas City, Mo., being in the latter year appointed superintendent of the St. Joseph division of the Burlington. He was transferred to the Aurora division in 1923, where he remained until January, 1930, when he was appointed general superintendent of the Missouri district, with headquarters at St. Louis, Mo. Early this year, when the Missouri and Iowa districts were combined to form the Central district, Mr. Farrington was made general superintendent of the new district, with headquarters at Burlington, Iowa, where he remained until his recent promotion, effective October 1.

James H. Aydelott, who has been appointed general manager of the Chicago, Burlington & Quincy, Lines West of the Missouri river, with headquar-

James H. Aydelott

ters at Omaha, Neb., as noted in the *Railway Age* for October 3, has spent his entire railway career of 29 years with the Burlington and its subsidiaries. He was born on August 13, 1883, in

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BETTER FIRES

FIREBAR CORPORATION
CLEVELAND OHIO.

Jersey County, Ill., and after a high school and business college education, entered the service of the Burlington in 1902, as a stenographer and clerk at Brookfield, Mo. From 1903 to 1908, he served as timekeeper and accountant at the same point, being in the latter year appointed chief clerk to the division superintendent at St. Joseph, Mo. Three years later he was appointed chief clerk to the general superintendent, at St. Louis, Mo., and in 1912, he went to Chicago as chief clerk to the assistant general manager. Mr. Aydelott was appointed trainmaster at La Crosse, Wis., in 1916, and in 1917, he was promoted to superintendent at Hannibal, Mo., later being transferred to Omaha, Neb., and thence to Casper, Wyo. He returned to Chicago in 1920, as superintendent of transportation, and two years later he was made general superintendent of the Illinois district, with headquarters at Galesburg, Ill. Early in 1930, Mr. Aydelott was appointed general manager of the Ft. Worth & Denver City and the Wichita Valley (subsidiaries of the Burlington), with headquarters at Ft. Worth, Tex., which position he held until his recent promotion, effective October 1.

J. C. Grisinger, who has been appointed general superintendent of the Central district of the Chicago, Burlington & Quincy, with headquarters at Burlington, Iowa, as noted in the *Railway Age* for October 3, has served 35 years in the operating department of the Burlington. He was born on June 30, 1880,

J. C. Grisinger

at Lenox, Iowa, and after a public school education entered railway service in 1896 as a station helper on the Burlington & Missouri River (now part of the Burlington), and later served as a telegraph operator. In 1901, he was promoted to train dispatcher, being subsequently advanced through the positions of assistant chief dispatcher and chief dispatcher. Mr. Grisinger was promoted to trainmaster in 1911, which position he held until 1917, when he was made inspector of transportation. In 1918, he was promoted to division superintendent at Sterling, Colo., later being transferred to the Casper division, with headquarters at Casper, Wyo., where he was located at the time of his recent promotion, effective October 1.

TRAFFIC

H. H. Elliott, assistant to general freight agent at Wilmington, N. C., has been appointed assistant general freight agent of the Atlantic Coast Line, with headquarters at Rocky Mount, N. C.

The Lehigh Valley has moved its New York City passenger office to 500 Fifth avenue, rooms 1108-1112. **S. W. Gafner,** assistant general passenger agent, and **H. J. Doering,** city passenger agent, are in charge.

ENGINEERING AND SIGNALING

J. M. Trissal, assistant electrical engineer (fixed property) of the Illinois Central, has been appointed to the newly-created position of electrical engineer (fixed property), with headquarters as before at Chicago.

Following the abolition of the Michigan division of the Cleveland, Cincinnati, Chicago & St. Louis, **C. W. Engle,** division engineer of this division, with headquarters at Wabash, Ind., has been transferred to the Northern division, with headquarters at Van Wert, Ohio, to succeed **W. D. Williams,** who has been transferred.

Irving Anderson, division engineer of the Kansas City division of the Atchison, Topeka & Santa Fe, with headquarters at Argentine (Kansas City), Kan., has been transferred to the Southern Kansas division, with headquarters at Chanute, Kan., succeeding **D. M. Rankin,** who has been appointed office engineer at the same point.

H. T. Livingston, engineer of construction of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been appointed division engineer of the Arkansas-Louisiana division with headquarters at Little Rock, Ark. Mr. Livingston succeeds **S. L. McClanahan,** who has been transferred to the Oklahoma-Southern division, with headquarters at Ft. Worth, Tex., where he replaces **A. H. Sturdevant,** who has been assigned to other duties. The position of engineer of construction has been discontinued following the completion of the Rock Island's line between Birmingham, Mo., and Trenton, part of which is joint with the Chicago, Milwaukee, St. Paul & Pacific. These changes will become effective on October 15.

E. W. Reich, signal inspector on the Reading, at Philadelphia, Pa., has been promoted to signal engineer, with headquarters at the same point, succeeding **A. Hall Yocum,** whose retirement was noted in the *Railway Age* for September 26. Mr. Reich was born at Frackville, Pa., on September 11, 1894, and entered

E. W. Reich

railway service in May, 1910, with the Philadelphia & Reading (now the Reading). He occupied various positions in the signal department, including that of batteryman and maintainer on automatic signal sections and that of leading maintainer at the Birdsboro (Pa.) interlocking. Later he was promoted to signal inspector at Philadelphia, which position he held until his recent promotion. From December 1, 1917, to July 3, 1919, Mr. Reich was out of railway service, being with the Signal Corps of the United States Army.

Robert R. Cummins, superintendent of the Savannah division of the Central of Georgia, has been appointed superintendent maintenance of way, with headquarters at Savannah, Ga., as before. Mr. Cummins was born on September 30, 1884, at Marion, Ala., and was graduated from the University of Alabama in 1906. He served for a time as rodman, levelman

Robert R. Cummins

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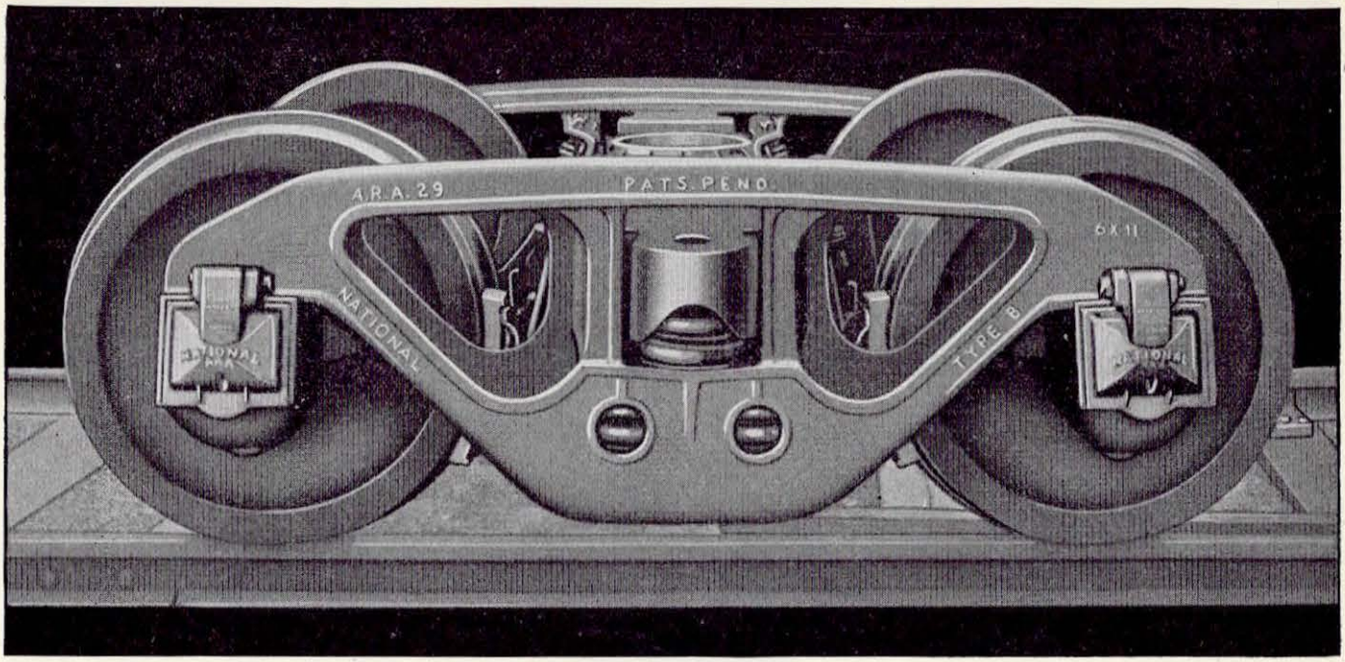
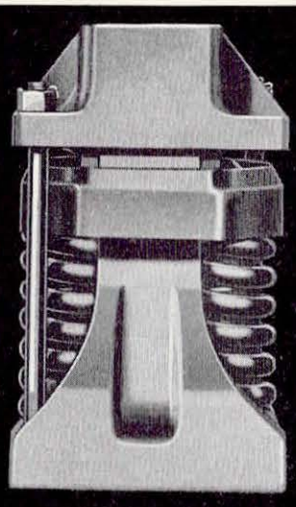
TRUCKS ››› that Speed Train Operation



SUPERIOR TRUCK PERFORMANCE WITHOUT EXTRA COST



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National Draft Gear
Another contribution by National to profitable freight operation. This gear stands first in the combination of capacity, sturdiness and endurance.

NATIONAL Type B trucks are designed for modern operating needs. ›› They are lighter and stronger and have increased spring capacity which helps to prevent damage to lading. They permit quick wheel change which speeds up maintenance work and reduces its cost. ›› For modern operating needs requiring economies in time and labor, National Type B trucks meet all requirements ... without any premium in cost. Details gladly furnished on request.

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General Offices: CLEVELAND, OHIO

Sales Offices: New York, Philadelphia, Washington, Chicago, St. Louis, San Francisco
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

NATIONAL TYPE B TRUCKS

and transitman on the Seaboard Air Line, and from July, 1907, until August, 1909, was transitman and resident engineer on the Georgia & Florida on surveys and construction from Vidalia, Ga., to Madison, Fla. On August 27, 1909, Mr. Cummins entered the service of the Central of Georgia as draftsman in the chief engineer's office. From January 1, 1912, until January 15, 1914, he served as assistant engineer, and then became pilot engineer, government valuation, which position he held until June 1, 1916. He then became supervisor of bridges and buildings of the Southwestern division, being transferred in this capacity to the Columbus division on January 20, 1917. He remained here until July 1, 1918, and was then appointed roadmaster of the Macon division, holding this position until August 16, when he was commissioned first lieutenant in the engineers overseas service. He was mustered out of service in July, 1919. On August 1, 1919, Mr. Cummins was appointed assistant trainmaster of the Columbus Division of the Central of Georgia, and became roadmaster of the Southwestern division on February 1, 1920. On January 15, 1925, he was transferred in the same capacity to the Columbus division, and in December, 1927, he was appointed superintendent of the Savannah division, the position he held until his recent promotion.

MECHANICAL

J. W. Highleyman, assistant general superintendent of motive power and machinery of the Union Pacific System, with jurisdiction over the Oregon Short Line, the Oregon-Washington Railroad & Navigation Co., and the Los Angeles & Salt Lake, with headquarters at Pocatello, Idaho, has been promoted to general superintendent of motive power and machinery of the system, with headquarters at Omaha, Neb. Mr. Highleyman succeeds **O. S. Jackson,** whose death was noted in the *Railway Age* for October 3. **J. W. Burnett,** assistant general superintendent of motive power and machinery, at Omaha, with jurisdiction over the Union Pacific Railroad, has been transferred to Pocatello, to succeed Mr. Highleyman. **Emmett J. Cole,** assistant to the general superintendent of motive power and machinery, at Omaha, has been promoted to succeed Mr. Burnett. These appointments became effective on October 1.

Mr. Highleyman was born in West Virginia in 1868, and after serving as a machinist on the Missouri Pacific at Sedalia, Mo., he entered the service of the Union Pacific in 1893, in the shops at Armstrong, Kan. Two years later he was promoted to foreman and subsequently served as master mechanic on the Kansas and Wyoming divisions. He left railway service in 1918, to go with the mechanical department of the United States Army in France, where he subsequently attained the rank of major. Mr. Highleyman returned to railway service in 1919 as a master mechanic on the Union Pacific at Cheyenne, Wyo., being appointed superintendent of shops at the same point in 1922. In 1923, he was promoted to assistant superintendent of motive power and machinery of the Union Pacific Railroad, with headquarters at Omaha, being transferred to the Oregon Short Line in 1928, with headquarters at Pocatello, Idaho. On October 1, 1930, he was further advanced to assistant general superintendent of motive power and machinery on the Union

J. W. Highleyman

Pacific System, with jurisdiction over the O. S. L., the O.-W. R.R. & N. and the L. A. & S. L., with headquarters at the same point, which position he held until his recent promotion.

Mr. Cole's entire railway mechanical career of 23 years has been spent with

Emmett J. Cole

the Union Pacific. He was born on November 17, 1894, at Cheyenne, Wyo., and entered the service of the Union Pacific on January 25, 1908, as a machinist apprentice at Cheyenne, subsequently serving as machinist, machine inspector, erecting gang foreman and district foreman. On September 15, 1923, he was appointed superintendent of shops at Cheyenne, being transferred to Omaha on August 1, 1925. Mr. Cole was promoted to assistant to the general superintendent of motive power and machinery of the Union Pacific System on January 1, 1929, which position he retained until his recent promotion.

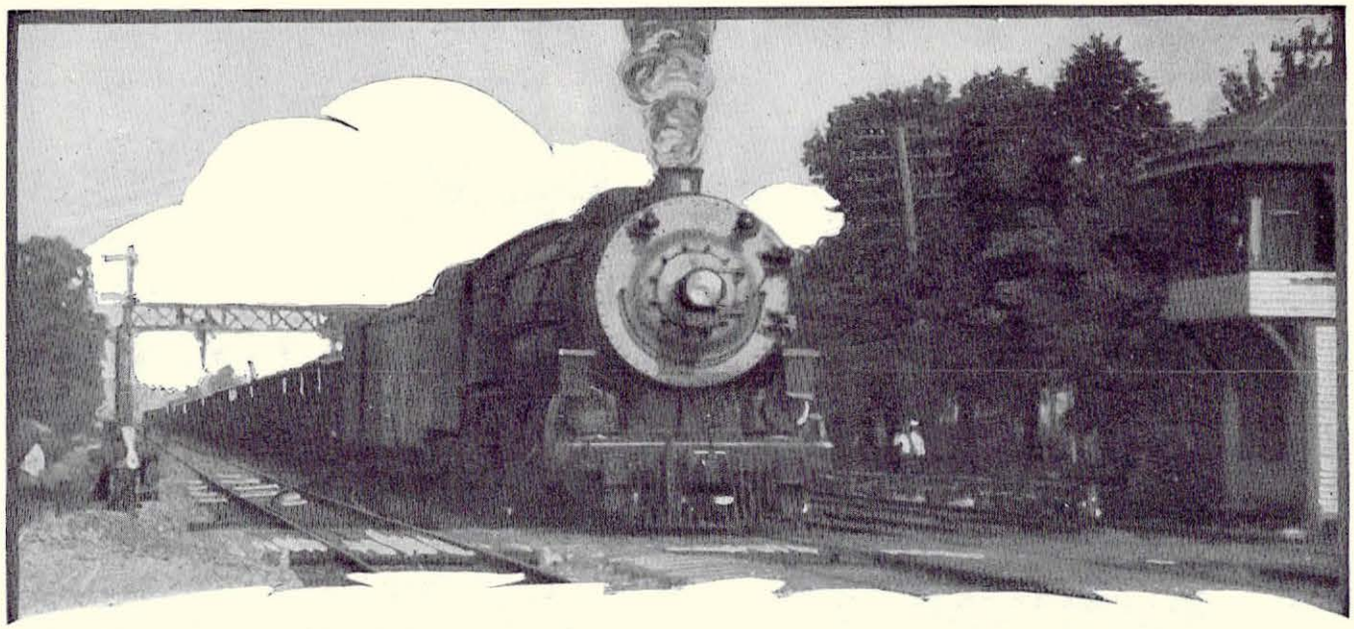
OBITUARY

Peyton L. Graves, general agent of the Atlanta, Birmingham & Coast, died suddenly of a heart attack at his office at Atlanta, Ga., on October 1.

John G. Stidger, treasurer of the Wheeling & Lake Erie, died suddenly while being taken to a hospital from his office at Cleveland, Ohio, where he had been stricken with a heart attack. He was 64 years old.

William T. Kuhn, superintendent motive power of the Toronto, Hamilton & Buffalo, died suddenly from a heart attack at his home in Hamilton, Ont., on September 26. He was born at East Radford, Va., in 1872, and, after attending public schools, he completed his education with a mechanical course at a correspondence school in Scranton, Pa. Mr. Kuhn entered railway service with the Norfolk & Western, in 1888, as machinist apprentice, and served consecutively to 1900, as machinist, roundhouse foreman, and assistant air-brake instructor. In 1900, he entered the service of the Lake Shore & Michigan Southern (now part of the N.Y.C.), as roundhouse foreman and mechanical inspector, and continued with that road until March, 1911, when he undertook the position of assistant master mechanic of the Lake Erie & Western (now part of the New York, Chicago & St. Louis). He became connected with the Toronto, Hamilton & Buffalo on October 16, 1911, as master mechanic, and on June 1, 1914, he was advanced to superintendent motive power, the position he held until his death.

* * *



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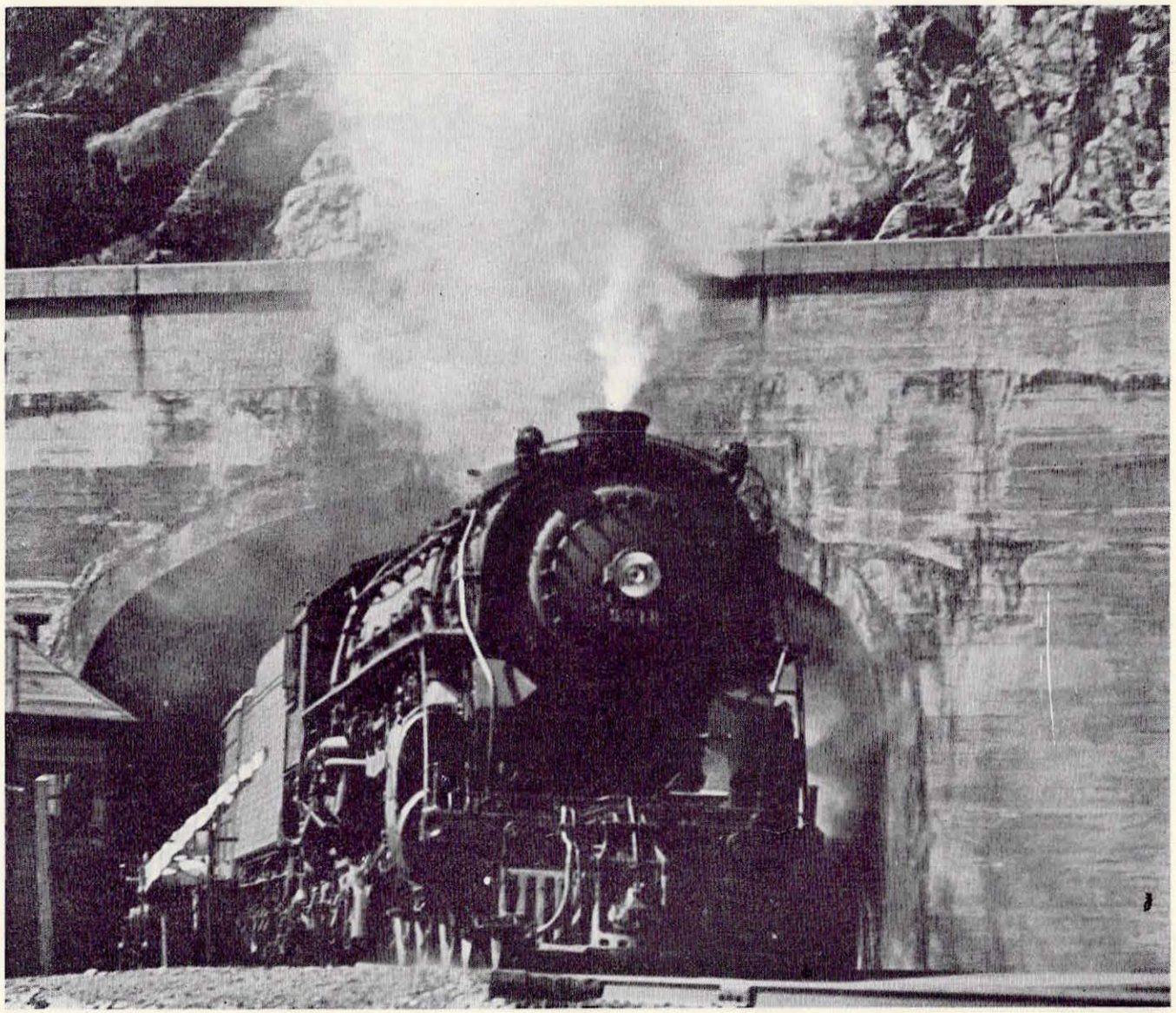
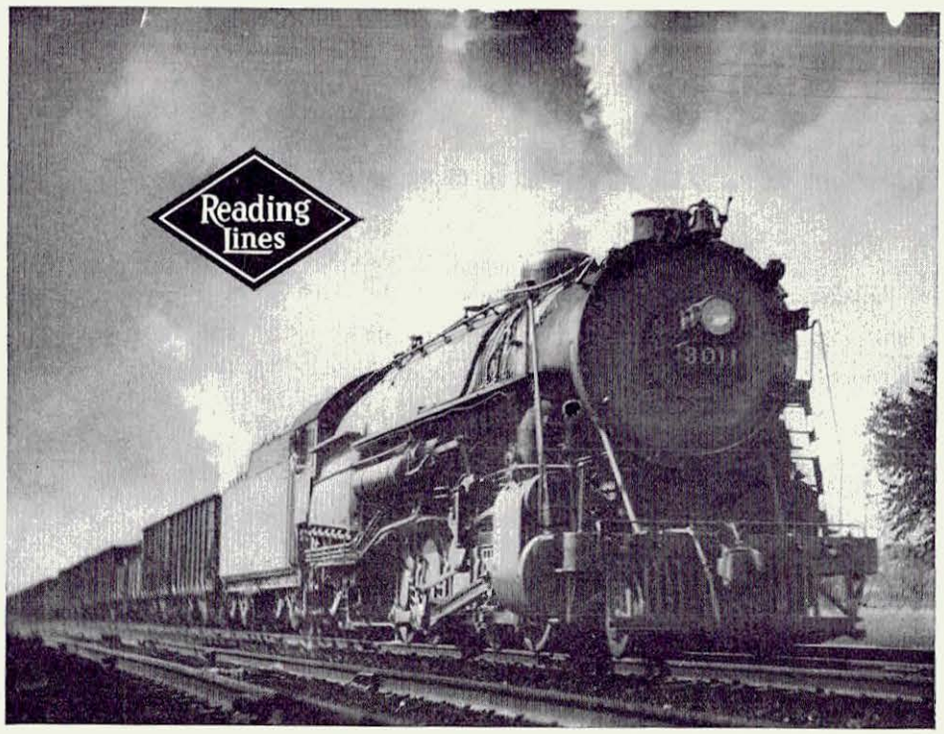


Carbon-Vanadium Rods *and* Pins



On New Freight Locomotives for the Reading Company

TEN new 2-10-2 type locomotives, built by The Baldwin Locomotive Works and delivered in July to the Reading Company, are among the largest of their type ever constructed. They were purchased to improve the Reading's service and prepare for greater traffic, and are now efficiently handling heavy tonnages of coal and merchandise freight over the main lines of the Railway.

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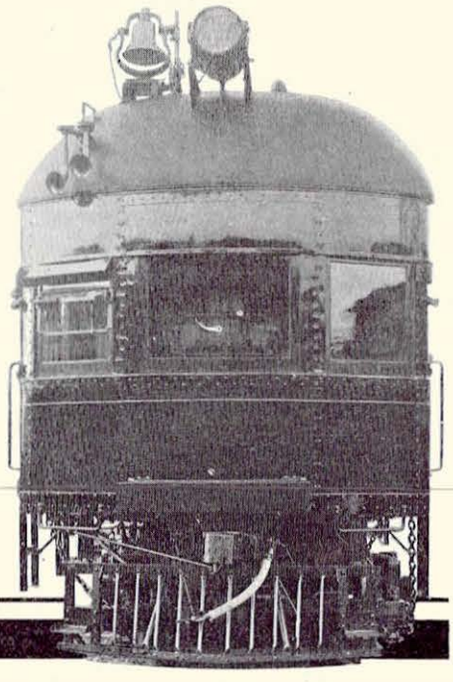

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STATEMENT of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of *Railway Age*, published weekly at East Stroudsburg, Pa., for October 1, 1931.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Roy V. Wright, who, having been duly sworn according to law, deposes, and says that he is the Managing Editor of the *Railway Age*, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
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   Editor, S. O. Dunn, 105 W. Adams St., Chicago, Ill.
   Managing Editor, Roy V. Wright, 30 Church St., New York, N. Y.
   Business Managers, None.
2. That the owners are: Simmons-Boardman Publishing Company, 30 Church Street, New York, N. Y.; Simmons-Boardman Publishing Corporation, 30 Church Street, New York, N. Y. Stockholders of 1 per cent or more of the total amount of stock are: E. A. Simmons, 30 Church Street, New York, N. Y.; I. R. Simmons, 1625 Ditmas Ave., Brooklyn, N. Y.; P. A. Lee, Hopatcong, N. J.; H. Anderson, Hopatcong, N. J.; E. G. Wright, 398 N. Walnut Street, E. Orange, N. J.; S. O. Dunn, 105 West Adams Street, Chicago, Ill.; C. E. Dunn, 3500 Sheridan Boul., Chicago, Ill.; B. L. Johnson, 105 W. Adams Street, Chicago, Ill.. W. A. Radford, 407 S. Dearborn Street, Chicago, Ill.; L. B. Sherman, 375 Sheridan Road, Winnetka, Ill.; Mae E. Howson, 105 West Adams Street, Chicago, Ill.; F. H. Thompson, Terminal Tower, Cleveland, Ohio. Spencer Trask & Company, 25 Broad Street, New York, N. Y. General Partners of Spencer Trask & Company are: E. M. Bulkley, Acosta Nichols, Cecil Barret, J. Graham Parsons, C. Everett Bacon, William R. Basset, F. Malbone Blodget, Percival Gilbert, Harry S. Allen, Harry A. Minton, William Beckers, W. V. C. Ruxton, all of 25 Broad Street, New York, N. Y.; Arthur H. Gilbert, 308 LaSalle St., Chicago, Ill.; S. B. Colgate, Special Partner, 52 Wall Street, New York, N. Y.; William E. Stanwood, 50 Congress St., Boston, Mass.; John Nightingale, 50 Congress St., Boston, Mass.
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Sworn to and subscribed before me this 1st day of October, 1931.

[Seal] H. D. Nelson.

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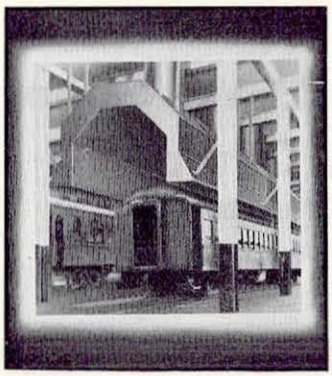
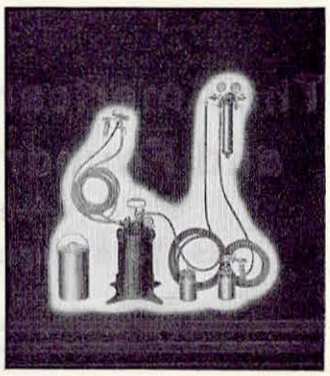
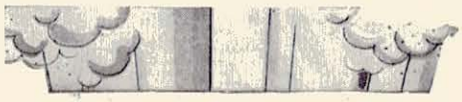
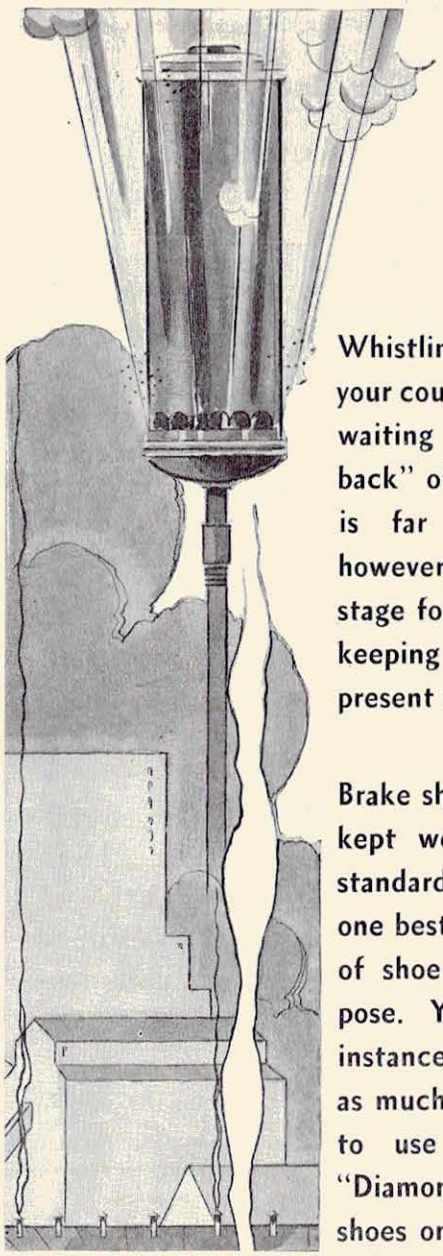






Whistling Helps



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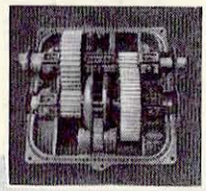

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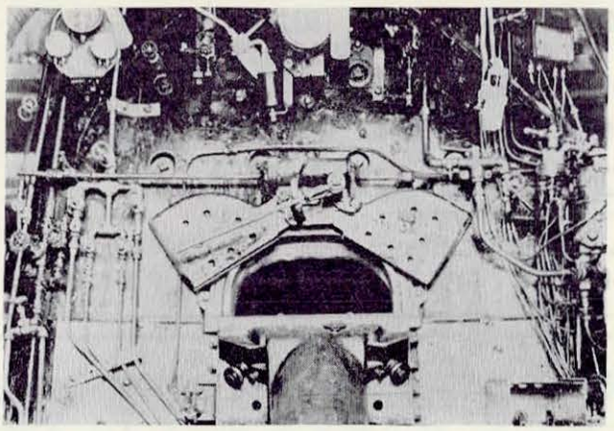

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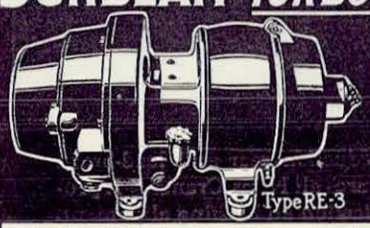

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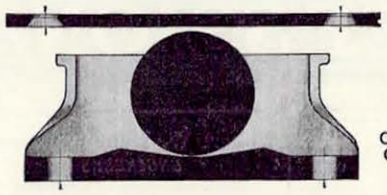

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National Malleable & Steel Castings Co.
Standard Coupler Co.
Westinghouse Air Brake Co.

Couplings, Hose.
Fort Pitt Malleable Iron Co.
Gold Car Heating & Lighting Co.
Ingersoll-Rand Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Cranes, Ballast Cleaning.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Barge.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Bracket.
Shephard-Niles Crane & Hoist Corp.

Cranes, Crawler.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Crawling Shovels and Draglines.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Diesel.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Electric Traveling.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Gantry.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.
Shephard-Niles Crane & Hoist Corp.

Cranes, Gasoline.
Industrial Brownhoist Corp
Ohio Locomotive Crane Co.

Cranes, Grab Bucket.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Handpower.
Industrial Brownhoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Jib.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Worthington Pump & Machinery Corp.

Cranes, Locomotive.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.

Cranes, Overhead.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Pillar.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Portable.
Orton Crane & Shovel Co.

Cranes, Transfer.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Traveling.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Wharf.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Wrecking.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Crank Pins — (See Pins, Crank).

Creosote.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
International Creosoting & Constr. Co.
National Lumber & Creosoting Co.

Creosote, Wood Preservative Treatment.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Cribbing Units.
Federal American Cement Tile Co.

Cross Arms, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Steel.
Bethlehem Steel Co.

Crossheads & Shoes.
Baldwin Locomotive Wks.
Barco Mfg. Co.
International Creosoting & Construction Co.

Crossing Signals & Signs.
Railroad Supply Co.

Crossings—(See Frogs and Crossings).

Crossings, Pavement.
Carey Co., The Philip.

Crushers, Coal.
American Sheet & Tin Plate Co.
Orton Crane & Shovel Co.

Culverts.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Toncan Culvert Manufacturers' Association.

Culverts, Corrugated Iron
Armco Culvert Manufacturers' Association.
Republic Steel Corp.

Culverts, Part Circle
Armco Culvert Manufacturers Association

Culverts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cups, Oil.
New York Air Brake Co.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.

Curtain Material, Car.
Ryerson & Son, Jos. T.

Curtains, Cab.
Lehon Co., The.

Cutting and Welding Apparatus.
Electric Railweld Service Corp.
Oxweld Railroad Service Co.
Westinghouse Electric & Mfg. Co.

Cut-Off Indicators and Recorders.

Cylinder Parts, Finished and Rough.
National Tube Co.
Valve Pilot Co.

Cylinders, Air Brake.
Westinghouse Air Brake Co.

Cylinders, Cast Steel Locomotive.
General Steel Castings Corp.

Cylinders, Locomotive
Union Steel Casting Co.

Deoxidizers.
Q & C Co., The.
Vanadium Corp. of America.

Derricks.
Industrial Brownhoist Corp.

Diesel Electric Power Plants.
Fairbanks-Morse & Co.
Westinghouse Elec. & Mfg. Co.

Dirt Collectors.
New York Air Brake Co.
Westinghouse Air Brake Co.

Disinfectants.
West Disinfecting Co.

Dispatching Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Ditching Machinery.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Door Fixtures — (See Fixtures, Car Door).

Doors, Car.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
Wine Railway Appliance Co.

Doors, Locomotive Firebox.
Franklin Railway Supply Co., Inc.

Doors, Rolling, Steel.
Kinnear Mfg. Co.

Draft Arms.
American Steel Foundries.
Birdsboro Steel Foundry & Machine Co.
Bradford Corporation.
Symington Co., The.
Universal Draft Gear Attachment Co.

Draft Gear Attachments.
Symington Co., The

Draft Gears.
American Steel Foundries.
Bradford Corporation.
Cardwell-Westinghouse Co.
Edgewater Steel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Union Draft Gear Co.
Universal Draft Gear Attachment Co.

Draft Yokes.
American Steel Foundries.
Bettendorf Co., The.
Buckeye Steel Castings Co.
Gould Coupler Co., The.
McConway & Torley Co.
Miner, W. H.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Co.
Symington Co. The.
Universal Draft Gear Attachment Co.

Drainage Gates, Automatic
Armco Culvert Mfrs Assoc.
Republic Steel Corp.

Drains, Perforated Iron.
Republic Steel Corp.

Drawbar Centering Device.
Gould Coupler Co., The.
Miner, W. H.

Drawbars, Unit Safety.
Franklin Railway Supply Co., Inc.
Industrial Brownhoist Corp.

Dredging Machinery.
Industrial Brownhoist Corp.

Drilling Machines.
Sellers & Co., Inc., Wm.

Drilling Machines, Bonding.
Railroad Supply Co.

Drilling Machines, Pneumatic
Ingersoll-Rand Co.

Drilling Machines, Rock.
General Electric Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drilling Machines, Upright and Radial.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.

Drills.
Ingersoll-Rand Co.

Drills, Close Corner.
Ingersoll-Rand Co.

Drills, Concrete.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Steel Rock and Steel Sharpened.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Track & Bending.
Bird-Archer Co., The.
Ingersoll-Rand Co.

Drive Gas Electric Coaches.
General Electric Co.

Drive Gas Electric Locomotives
Westinghouse Electric & Mfg. Co.

Driving Boxes (Extended Main).
Franklin Railway Supply Co., Inc.

Drop Door Mechanism.
Wine Railway Appliance Co.

Dynamos—(See Generators, Electric).

Electrical Cable Accessories.
General Electric Supply Corp.

Electric Cables.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Electrical Instruments.
Electric Service Supplies Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Electrical Supplies.
General Electric Co.
General Electric Supply Corp.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Electrification, Railroad.
Battey & Kipp.
General Electric Co.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.

Electric Heaters.
General Electric Supply Corp.

Electrical Insulation.
General Cable Corp.
General Electric Supply Corp.

Electrical Porcelain Insulators.
General Electric Supply Corp.

Electric Motors.
General Electric Supply Corp.

Electric Rivet Heaters.
General Electric Supply Corp.

Electric Switches.
General Electric Supply Corp.

Enamels.
Lowe Bros. Co., The.
Sherwin-Williams Co.

End Frames, Cast Steel, Passenger Car.
General Steel Castings Corp.

Ends, Steel.
Hutchins Car Rfg. Co.
Union Metal Products Co.

Engineers, Consulting, Civil, Elec., Hydraulic, Mechanical.
Battey & Kipp.
Hunt Co., Robt. W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Contracting.
Battey & Kipp.
United Engineers & Constructors, Inc.

Engineers and Contractors.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Construction.
Battey & Kipp.
Roberts & Schaefer Co.
United Engineers & Constructors, Inc.

Engineers and Contractors, Elec., Hydraulic, Mech.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
Roberts & Schaefer Co.

Engineers, Inspecting.
Gulick-Henderson Co.
Hunt Co., Robert W.
Muhlfeld, John E.
Pittsburgh Testing Laboratory.
United Engineers & Constructors, Inc.

Engineers, Valuation.
Hunt Co., Robert W.
United Engineers & Constructors, Inc.

Engines, Crude & Fuel Oil.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Diesel.
Worthington Pump & Machinery Corp.

Engines, Gas.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Engines, Gas & Gasoline.
American Car & Foundry Motors Co.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Hoisting.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Excavators.
Industrial Brownhoist Corp.

Exhaust & Heater Pipe.
Union Asbestos & Rubber Co.

Exhaust & Ventilating Fans.
General Electric Supply Corp.

Expanders, Tube.
Ryerson & Son, Joseph T.

Fans, Exhaust & Ventilating.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Fasteners, Car Door.
Camel Sales Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Feed Water Heater Systems.
Bird-Archer Co., The.
Worthington Pump & Machinery Corp.

Fencing Wire—(See Wire, Fence).

Fence Posts, Treated.
American Steel & Wire Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Ferro Alloys.
Vanadium Corp. of America.

Ferro, Chromium.
Vanadium Corp. of America.

Ferro, Molybdenum.
Vanadium Corp. of America.

Ferro, Silicon.
Vanadium Corp. of America.

Ferro, Tungsten.
Vanadium Corp. of America.

Ferro, Vanadium.
Vanadium Corp. of America.

Filters, Air.
New York Air Brake Co.
Westinghouse Air Brake Co.

Filters, Water & Industrial.
Graver Tank & Mfg. Corp.

Filtration Plants (Water).
Graver Tank & Mfg. Corp.

Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works.

Fire Fighting & Protection Equipment.
Johns-Manville Corp.

Fittings, Air Brakes.
Westinghouse Air Brake Co.

Fittings, Steam.
Vapor Car Heating Co., Inc.

Fixtures, Car Door.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Flangers, Snow.
Q & C Co., The.

Floodlights.
General Electric Supply Corp.
Graybar Electric Co.
Oxweld Railroad Service Co.
Pyle-National Co.
Symington Co., The.
Westinghouse Elec. & Mfg. Co.

Floodlights, Acetylene.
Oxweld Railroad Service Co., The.

Flooring.
Carey & Co., Philip, The.
Johns-Manville Corp.

Flooring, Car.
Tuco Products Corp.

Flooring, Coach.
Tuco Products Corp.

Flooring, Composition.
Johns-Manville Corp.
Tuco Products Corp.

Flooring, Treated.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Floor Plates, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Company

Floor Slabs, Concrete.
American Cement Tile Mfg. Co.

Flue Cleaners—(See Cleaners, Flue).

Flue Cutters—(See Cutters, Flue).

Flues, Boiler—(See Tubes, Boiler).

Flue Shop Equipment.
Ryerson & Son, Joseph T.

Forges, Rivet Heating.
Ryerson & Son, Joseph T.

Forging Hammers.
Industrial Brownhoist Corp.

Forgings.
American Bridge Co.
American Steel Foundries
Baldwin Locomotive Works The.
Bethlehem Steel Co.

Brill Co., The J. G.
Carnegie Steel Co.
Edgewater Steel Co.
General Railway Signal Co.
Gould Coupler Co., The.
Illinois Steel Co.
Midvale Co., The.
Mt. Vernon Car Mfg. Co.
Neely Nut & Bolt Co.
Pressed Steel Car Co.
Standard Steel Works Co.
Steel Car Forge Co.
Universal Draft Gear Attachment Co.

Forgings, Drop.
Baldwin Locomotive Works, The.
Brill Co., The J. G.
General Railway Signal Co.
Steel Car Forge Co.
Union Switch & Signal Co.

Forgings, Monel Metal.
International Nickel Co., The.

Foundry Supplies.
Bird-Archer Co., The.

Frames, Cast Steel Locomotive
General Steel Castings Corp.

Frames, Locomotive.
American Steel Foundries
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Machine Co.
Ohio Steel Foundry Co., The.
Union Steel Casting Co.

Frames, Truck.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works
Bettendorf Co., The.
Birdsboro Steel Foundry & Machine Co.
Buckeye Steel Castings Co
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
Ohio Steel Foundry Co. The.
Pressed Steel Car Co.
Pyle-National Co.
Symington Co., The.

Frames, Vanadium.
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Machine Co.
Union Steel Casting Co.

Frogs and Crossings.
Bethlehem Steel Co.
Ramapo Ajax Corp.

Fulcrums, Brake Beam.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
National Malleable & Steel Castings Co.

Furnaces, Electric.
General Electric Co.
Westinghouse Elec. & Mfg Co.

Furnaces, Gasoline.
Railroad Supply Co.

Furnaces, Rivet Heating—(See Forges, Rivet Heating).

Furniture.
Aluminum Co. of America

Gage Testers—(See Testers Gage).

Gages, Air.
Westinghouse Air Brake Co.

Gages, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Gages, Steam.
Ashton Valve Co.

Gages, Tire.
Schrader's Son, Inc., A.

Gages, Wheel Press Recording.
Ashton Valve Co.

Gaskets.
Westinghouse Air Brake Co.

Gasoline.
Ethyl Gasoline Corp.

Gear Blanks, Rolled Steel.
Edgewater Steel Co.
Standard Steel Works Co.

Gears and Pinions.
American Steel Foundries.
Westinghouse Elec. & Mfg. Co.

Gears, Silent.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Gears, Valve — (See Valve Gears).

Generators, Acetylene.
Oxweld Railroad Service Co.

Generators, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Sunbeam Electric Mfg. Co
Westinghouse Elec. & Mfg Co.

Goggles, Welding.
Oxweld Railroad Service Co., The.
Sunbeam Electric Mfg. Co

Graders, Elevating.
Western Wheeled Scraper Co.

Grapples, Wood.
Industrial Brownhoist Corp

Grate Bars.
Q & C Co., The.

Grate Shakers, Automatic.
Franklin Railway Supply Co., Inc.

Grates.
Firebar Corp.

Grease Forming Machines.
Franklin Railway Supply Co., Inc.

Grey Iron.
American Brake Shoe & Foundry Co.

Grinders, Internal.
Micro Machine Co.

Grinders, Portable Crank Pin
Micro Machine Co.

Grinding Machines.
Sellers & Co., Inc., Wm.

Grinding Machines, Portable
Ingersoll-Rand Co.
Ryerson & Son, Inc., Joseph T.

Guard Rails, Treated.
Curtin-Howe Corp.
International Creosoting & Construction Co.

Guard Rails, Foot Guard.
Q & C Co., The.

Guard Rails (One Piece).
Bethlehem Steel Co.
Ramapo Ajax Corp.

Guard Switch Point.
Q & C Co., The.

Guards, Cattle.
American Bridge Co.

Guards, Dust.
Gould Coupler Co., The.
Symington Co., The.

Hair Felt.
Johns-Manville Corp.

Hammers, Pneumatic.
Ingersoll-Rand Co.

Hammers, Riveting.
Ingersoll-Rand Co.

Hammers, Steam.
Industrial Brownhoist Corp
Sellers & Co., Inc., Wm

Hand Brakes—(See Brakes Hand).

Hangers, Ball Bearing.
S. K. F. Industries, Inc.

Hand Rails & Fittings.
Aluminum Co. of America

Hangers, Bottom Rod Safety
Chicago Railway Equipment Co.

Hangers, Car Door—(See Fixtures, Car Door).

Headgates, Sliding
Armco Culvert Manufacturers Association

Headlight Repair Parts Electric.
Electric Service Supplies Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co

Headlights, Electric.
General Electric Co.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co
Westinghouse Electric & Mfg. Co.

Headlights, Reflectors & Cases.
Pyle-National Co.
Sunbeam Electric Mfg. Co

Heaters, Electric.
Gold Car Heating & Lighting Co.
Westinghouse Electric & Mfg. Co.

Heaters, Feedwater.
Graver Tank & Mfg. Corp

Heaters, Feedwater Locomotive.
Coffin Co., Jr., The J. S.
Superheater Company, The
Worthington Pump & Machinery Corp.

Heaters, Feed Water, Stationary.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Heating & Ventilating Apparatus.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Westinghouse Electric & Mfg. Co.

Heating Equipment, Car.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Heating Systems, Car (Electric and Steam).
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

High Temperature Cements.
Carey & Co., Philip, The

Highway Crossing Protection Devices.
American Bridge Co.
Franklin Railway Supply Co., Inc.
Griswold Signal Co.
Railroad Supply Co.

Hoists, Chain.
Milwaukee Electric Crane & Hoist Corp.
Ryerson & Son, Jos. T.

Hoists, Electric.
Milwaukee Electric Crane & Hoist Corp.

Hoists, Pneumatic.
Ingersoll-Rand Co.

Hoisting Machinery.
Industrial Brownhoist Corp
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co

Hooks, Wrecking.
National Malleable & Steel Castings Co.

Horns, Pneuphonic.
Westinghouse Air Brake Co.

Hose, Air, Steam, Etc.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Hose, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Hose, Tender.
Westinghouse Air Brake Co.

Incandescent Lamps.
General Electric Supply Corp.

Indicators, Speed & Cut-off
Valve Pilot Co.

Ingots.
Birdsboro Steel Foundry & Machine Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
McConway & Torley Co
Standard Steel Works Co

Injectors, Exhaust Steam.
Sellers & Co., Inc., Wm.
Superheater Co., The.

Inspection of Material and Equipment—(See Engineers, Inspection).

Insulated Wire.
American Steel & Wire Co
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Insulation, Car.
Carey Co., Philip, The.
Wood Conversion Co.

Insulation, Car, Bldg.
Carey Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.
Tuco Products Corp.
Union Asbestos & Rubber Co.
Wood Conversion Co.

Insulation, Electrical.
General Electric Co.
Westinghouse Elec. & Mfg Co.

Insulation, Exhaust & Heater Pipe.
Carey Co., Philip, The.
Johns-Manville Corp.
Tuco Products Corp.
Union Asbestos & Rubber Co.

Insulation, Heat.
Carey Co., Philip, The.
Miner, W. H.

Insulation Tape.
General Electric Supply Corp.

Insulators, Electrical, Porcelain.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Interlocking Plant Equipment.
General Railway Signal Co.
Union Switch & Signal Co.

Iron Chain.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Charcoal.
Bethlehem Steel Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co
Ryerson & Son, Joseph T.

Iron, Engine Bolt.
Lockhart Iron & Steel Co
Logan Iron & Steel Co.
Ryerson & Son, Joseph T

Iron, Forging Billets.
Lockhart Iron & Steel Co
Logan Iron & Steel Co.

Iron, Hollow Staybolt.
Falls Hollow Staybolt Co
Ryerson & Son, Joseph T

Iron, Hollow Staybolt Bars
Bethlehem Steel Co.
Falls Hollow Staybolt Co
Ryerson & Son, Joseph T

Iron, Pig.
Bethlehem Steel Co.

Iron, Refined.
Ewald Iron Co.
Falls Hollow Staybolt Co
Lockhart Iron & Steel Co
Logan Iron & Steel Co.
Reading Iron Co.
Ryerson & Son, Joseph T

Iron, Rivet.
Logan Iron & Steel Co.

Iron, Staybolt — (See also Staybolts).
Ewald Iron Co.
Falls Hollow Staybolt Co
Lockhart Iron & Steel Co
Logan Iron & Steel Co.
Reading Iron Co
Ryerson & Son, Joseph T

Jacking, Locomotive.
Carey Co., Philip, The.

Jacking Method of Installing Pipe
Armco Culvert Manufacturers Association

Jacks, Smoke.
Carey Co., Philip, The.
Johns Manville Corp.

Joints, Air Reservoir.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Blow Off Line (Roundhouse).
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Coach and Coach Yard.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Flexible.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co. Inc.

Joints, Flexible Ball.
Barco Mfg. Co.

Joints, Rail.
American Steel Foundries
Carnegie Steel Co.
Illinois Steel Co.
Q & C Co., The.
Rail Joint Co.
Union Switch & Signal Co

Joints, Steam, Air & Liquid
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co. Inc.

Joints, Swing.
Barco Mfg. Co.
Vapor Car Heating Co., Inc.

Journal Boxes and Lids.
Allegheny Steel Co.
American Steel Foundries.
Brill Co., The J. G.
Gould Coupler Co., The.
Hunt-Spiller Mfg. Corp.
National Malleable & Steel Castings Co.
Pullman Car & Mfg. Corp.
Railway Steel Spring Co.
Symington Co., The.
Union Spring & Mfg. Co.

Journal Oilers, Car & Locomotive.
Ardco Mfg. Co.

Keys, Brake Shoe.
Bradford Corporation.
Buffalo Brake Beam Co.
Mt. Vernon Car Mfg. Co.
Steel Car Forge Co.
Union Spring & Mfg. Co.

Knuckles, Emergency.
Q & C Co., The.

Laboratories, Testing.
Hunt Co., Robert W.
Pittsburgh Testing Laboratory.

Lacquers.
General Electric Supply Corp.
Sherwin-Williams Co.

Ladders, Steel Car.
Wine Railway Appliance Co.

Lagging, Locomotive.
Carey & Co., Philip, The
Johns-Manville Corp.

Lamps, Incandescent.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg Co.

Lamps, Inspector's.
Oxweld Railroad Service Co., The.

Lath, Metal.
Armco Railroad Sales Co

Lathes, Axle.
Sellers & Co., Inc., Wm

Lathes, Engine.
Ryerson & Son, Joseph T

Lathes, Wheel.
Sellers & Co., Inc., Wm.

Lead, White.
National Lead Co.

Lighting Equipment, Car.
Electric Storage Battery Co.

Lighting Fixtures and Systems.
General Electric Supply Corp.
Graybar Electric Co.
Pyle-National Co.

Lighting Plants, Gas, Electric
Pyle-National Co., The.
Sunbeam Electric Mfg. Co

Lightning Arresters.
General Electric Supply Corp.

Line Material.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lock Nuts—(See Nut Locks)

Locomotive Jacket Sheets.
Armco Railroad Sales Co.

Locomotive Water Conditioners
Bird-Archer Co., The.

Locomotives, Contractors.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Electric.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works
Westinghouse Elec. & Mfg. Co.

Locomotives, Gasoline.
Baldwin Locomotive Works.
Lima Locomotive Works

Locomotives, Gas-Electric.
Brill Co., The J. G.
Electro-Motive Co.

Locomotives, Geared.
Lima Locomotive Works.

Locomotives, Industrial.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Mine.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works
Westinghouse Elec. & Mfg Co.

Locomotives, Oil Engine Electric Driven.
American Locomotive Co.
Baldwin Locomotive Works
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg Co.
Whitcomb Co., Geo. D. The.

Locomotives, Rebuilt.
American Locomotive Co.
Locomotives, Repair Parts.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.
Locomotives, Steam.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.
Locomotive Stokers.
Standard Stoker Co.
Locomotive Valve Pilot.
Valve Pilot Co.
Lubricators, Driving Box.
Franklin Railway Supply Co., Inc.
Lubricators, Piston Rod.
Q & C Co., The.
Lumber, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lumber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Industrial Lumber & Creosoting Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Machinery, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.
Machine Screws, Monel Metal
International Nickel Co., The.
Magnets, Lifting.
Industrial Brownhoist Corp.
Electro Metallurgical Sales Corp.
Mechanical Draft Apparatus—(See Heating and Vent. App.).
Mechanical Stokers.
Standard Stoker Co.
Melters, Snow, Electric.
Q & C Co., The.
Metallic Flexible Conduit.
General Electric Supply Corp.
Meters, Water & Oil.
Worthington Pump & Machinery Corp.
Milling Machines, Planer Type.
Sellers & Co., Inc., Wm.
Milling Machines, Plain and Universal.
Ryerson & Son, Joseph T.
Milling Machines, Portable Frame Jaw.
Micro Machine Co.
Mohair Upholstery Velvets.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.
Molybdenum Metal.
Vanadium Corp. of America.
Monel Metal, Rods, Sheets, Tubes, Wire, etc.
International Nickel Co., The.
Motors, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.
Motors & Generators.
Fairbanks-Morse & Co.
Moulding.
Aluminum Co. of America.
Multiple V Belt Drives.
Worthington Pump & Machinery Corp.
Nails.
American Steel & Wire Co.
Reading Iron Co.
Ryerson & Son, Joseph T.
Nipples, Air Hose.
Prime Manufacturing Co.
Nozzles, Exhaust.
Franklin Railway Supply Co., Inc.
Nozzles, Oxy-Acetylene Cutting.
Oxweld Railroad Service Co., The.
Nuts—(See Bolts and Nuts).
Nut Locks.
Dardelet Threadlock Corp.
Grip Nut Co.
Nuts, Tank Hose.
Prime Manufacturing Co., The.

Office Appliances.
Remington-Rand Business Service.
Oils, Diesel Engine
Vacuum Oil Co.
Oil, Dynamo
Vacuum Oil Co.
Oil-Electric Locomotives.
American Locomotive Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.
Oil Filtering & Storage Systems.
Graver Tank & Mfg. Corp.
Oils & Greases, Engine
Vacuum Oil Co.
Oils & Greases, Lubricating
Vacuum Oil Co.
Oils & Greases, Motor
Vacuum Oil Co.
Oil, Linseed.
National Lead Co.
Oils, Locomotive Valve
Vacuum Oil Co.
Oil Plugs, Steam Chest.
Franklin Railway Supply Co., Inc.
Oil, Turbine
Vacuum Oil Co.
Oxy-Acetylene Apparatus.
Oxweld Railroad Service Co., The.
Oxygen.
Oxweld Railroad Service Co., The.
Packing.
Westinghouse Air Brake Co.
Packing, Air Pump.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Westinghouse Air Brake Co.
Packing, Asbestos.
Packing, Cylinder and Valve Rod.
Johns-Manville Corp.
Hunt-Spiller Mfg. Corp.
Westinghouse Air Brake Co.
Packing, Locomotive Cab Cock.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Packing, Ring Boiler.
Union Asbestos & Rubber Co.
Packing, Semi-Metallic.
Pilot Packing Co.
Central Alloy Steel Corp.
Packing, Sheet.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Packing, Soft.
Carey & Co., Philip, The.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Packing, Throttle.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Paint Burners, Acetylene.
Oxweld Railroad Service Co., The.
Paint, Metal Protective.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.
Paint, Powder.
Aluminum Co. of America.
Paint Spraying Equipment.
De Vilbiss Mfg. Co., The.
Paints.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.
Paper, Carbon.
Remington-Rand Business Service.
Paper, Sheathing.
Carey & Co., Philip, The.
Patterns, for Iron, Steel & Brass Castings.
Baldwin Locomotive Works, The.
Pavement Breakers.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Pickling Equipment, Monel Metal.
International Nickel Co., The.

Pile Drivers.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Piling, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Piling, Sheet Steel.
American Bridge Co.
Carnegie Steel Co.
Inland Steel Company
Piling, Wood.
National Lumber & Creosoting Co.
Pilot Beams, Cast Steel.
General Steel Castings Corp.
Gould Coupler Co., The.
Pilots, Cast Steel.
General Steel Castings Corp.
Locomotive Finished Material Co.
Pins, Air Brake & Clevis.
Champion Rivet Co.
Pins, Center.
Miner, W. H.
Pins, Coupler Knuckle.
Champion Rivet Co.
McConway & Torley Co.
National Malleable & Steel Castings Co.
Pins, Crank.
American Locomotive Co.
Baldwin Locomotive Works.
Miner, Inc., W. H.
Standard Steel Works Co.
Union Asbestos & Rubber Corp.
Pipe, Corrugated Iron
Armco Culvert Manufacturers Association
Pipe, Paved Invert
Armco Culvert Manufacturers Association
Pipe Coverings.
Carey & Co., Philip, The.
Johns-Manville Corp.
Keasby & Mattison Co.
Pipe Fittings—(See Fittings, Pipe).
Pipe, Metal Culvert.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Republic Steel Corp.
Pipe, Perforated Iron
Armco Culvert Manufacturers Association
Pipe, Spiral Welded.
Armco Railroad Sales Co
Pipe, Steel Signal.
National Tube Co.
Pipe, Spiral Welded.
Armco Railroad Sales Co
Pipe, Wrought Iron.
Byers Co., A. M.
Reading Iron Co.
Planers, Plate.
Ryerson & Son, Jos. T.
Sellers & Co., Inc., Wm.
Plates.
Steel Car Forge Co.
Plates, Follower.
Steel Car Forge Co.
Plates, Boiler, Firebox—(See Steel Firebox).
Plates, Center—(See Bearings, Center).
Plates, Iron & Steel.
Armco Railroad Sales Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.
Plate & Sheet Metal Work.
Baldwin Locomotive Works, The.
Plates, Tie.
Illinois Steel Co.
Inland Steel Company.
Railroad Supply Co.
Tennessee Coal, Iron & Railroad Co.
Plates, Tin and Terne.
American Sheet & Tin Plate Co.
Platforms, Car.
Gould Coupler Co., The.
Standard Coupler Co.
Platforms, Cast Steel, Passenger Car.
General Steel Castings Corp.
Plows, Railroad and Grading.
Western Wheeled Scraper Co.

Plows, Snow.
American Locomotive Co.
Brill Co., The J. G.
Q & C Co., The.
Plush, Mohair.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.
Pneumatic Tools.
Ingersoll-Rand Co.
Poles, Creosoted.
National Lumber & Creosoting Co.
Poles, Power Distribution.
National Lumber & Creosoting Co.
Poles, Preservatively Treated.
National Lumber & Creosoting Co.
Poles, Signal.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
General Railway Signal Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Union Switch & Signal Co.
Poles, Steel Tubular.
Graybar Electric Co.
National Tube Co.
Poles, Telegraph.
National Lumber & Creosoting Co.
Poles, Transmission.
National Lumber & Creosoting Co.
Poles, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
General Electric Supply Corp.
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Poles, Wood
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Posts, Farm.
National Lumber & Creosoting Co.
Posts, Fence, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Inland Steel Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co
Posts, Highway.
National Lumber & Creosoting Co.
Posts, Steel Fence.
American Steel & Wire Co.
Q & C Co., The.
Posts, Wood.
National Lumber & Creosoting Co.
Powder, Blasting—(See Explosives).
Powdered Coal Equipment.
Muhlfeld, John E.
Power Plants.
General Electric Co.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.
Power Transmission Supplies.
Sellers & Co., Inc., Wm.
Preservatives, Wood.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Presses, Flanging Hydraulic.
Birdsboro Steel Foundry & Machine Co.
Presses, Hydraulic.
Baldwin-Southwark Corp.
Birdsboro Steel Foundry & Machine Co.
Presses, Wheel.
Birdsboro Steel Foundry & Machine Co.
Sellers & Co., Inc., Wm.
Pulverizers, Coal — (See Crushers, Coal).
Pumping Stations.
Fairbanks-Morse & Co.
Pump Liners, Monel Metal.
International Nickel Co., The.
Pump Rods, Monel Metal.
International Nickel Co., The.
Pump Shafts, Monel Metal.
International Nickel Co., The.
Pumps, Hydraulic.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Pumps & Pumping Mchy.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.
Poles, Creosoted.
National Lumber & Creosoting Co.
Pumps, Vacuum.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Punching and Shearing Machines.
Ryerson & Son, Joseph T.
Pushers, Coal.
Standard Stoker Co.
Pyrometers, Superheated Steam.
Superheater Co., The.
Rail Anchors.
Bethlehem Steel Co.
P. & M. Co., The.
Rail-Bonds.
American Steel & Wire Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.
Rail Braces — (See Braces, Rail).
Rail Reclamation Equipment.
Ryerson & Son, Joseph T.
Railroad Shops.
United Engineers & Constructors, Inc.
Railroad Structures — (See Engineers and Contractors, also Building)
Rail Splice Plates — (See Joints, Rail).
Rails.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.
Tennessee Coal, Iron & Railroad Co.
Thomson Rail Corp.
Railway Signals.
General Electric Supply Corp.
Rattan.
Hale-Kilburn Co.
Heywood-Wakefield Co.
Receivers, Air.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Recorders, Speed & Cut-off.
Valve Pilot Co.
Rectifiers for Signal Work.
General Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Reducing Valves.
Vapor Car Heating Co., Inc.
Reflectors, Headlight.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co
Refrigerators.
Wine Railway Appliance Co.
Regulators, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Relays.
General Railway Signal Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Logan Iron & Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Baldwin Locomotive Works, The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety).

Stokers, Locomotive.
Lower Stoker Co.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Lower Stoker Co.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

Testers, Rail.
Sperry Products, Inc.

Testers, Staybolt.
Flannery Bolt Co.

Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.

Tie Plates.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Company
Railroad Supply Co.

Ties, Creosoted.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Ties, Steel.
American Bridge Co.
Bethlehem Steel Co.
Carnegie Steel Co.

Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Tile, Cement, Concrete.
Federal American Cement Tile Co.

Timbers, Pre-framed, Treated
National Lumber & Creosoting Co.

Timber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Wood Conversion Co.

Tires.
Firestone Tire & Rubber Co.
General Tire & Rubber Co.
Goodyear Tire & Rubber Co.
Goodrich Rubber Co., B. F.

Tires, Steel.
Edgewater Steel Co.
Midvale Co., The.
Railway Steel Spring Co.
Standard Steel Works Co.

Toilet Papers
U. S. Envelope Co.

Tools, High Speed Steel.
Bethlehem Steel Co.
Bird-Archer Co., The.

Towers, Floodlight.
Pyle-National Co.

Track Skates.
Q & C Co., The.

Tractors.
Caterpillar Tractor Co.
Elwell-Parker Electric Co.
Industrial Lumber Co.
International Creosoting & Construction Co.

Tractors, Industrial.
Elwell-Parker Electric Co.
International Harvester Co.

Tractors, Turntable.
Nichols & Bro., Geo. P.

Train Control Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Tramways, Wire Rope.
American Steel & Wire Co.

Transfer Tables.
American Bridge Co.
Industrial Brownhoist Corp.
Nichols & Bro., Geo. P.

Transformers.
General Electric Supply Corp.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Trap Doors.
Edwards Co., O. M.

Trap Doors & Fixtures.
Tuco Products Corp.

Traps, Steam.
Johns-Manville Corp.

Treads, Bridge Floor.
Carnegie Steel Co.

Treads, Safety.
Ryerson & Son, Joseph T.

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Truck Frames—(See Frames, Truck).

Trucks, Oxy-Acetylene Supply.
Oxweld Railroad Service Co., The.

Trucks, Car and Locomotive.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works.
Bettendorf Company, The.
Birdsboro Steel Foundry & Machine Co.
Brill Co., The J. G.
Flexible Truck Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Standard Car Truck Co.
Symington Co., The.

Trucks, Cast Steel Tender.
General Steel Castings Corp.

Trucks, Cast Steel, Electric Car.
General Steel Castings Corp.

Trucks, Cast Steel, Car and Locomotive.
General Steel Castings Corp.

Trucks, Electric Storage Battery.
Elwell-Parker Electric Co.

Trucks, Industrial.
Elwell-Parker Electric Co.

Trucks, Motor.
Dodge Motor Truck Corp.
General Motors Truck Co
International Harvester Co.
Reo Motor Car Co.
White Co., The.

Trucks, Tender.
Flexible Truck Co.

Trucks, Trailer.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.

Tubes, Arch.
National Tube Co.

Tubes, Boiler.
Allegheny Steel Co.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Globe Steel Tubes Co.
National Tube Co.
Ryerson & Son, Joseph T.

Tubes, Boiler, Charcoal Iron.
Bethlehem Steel Co.
Reading Iron Co.

Tubes, Staybolt.
Falls Hollow Staybolt Co.

Tubes, Tire.
Firestone Tire & Rubber Co.
Goodyear Tire & Rubber Co.

Tubing.
Aluminum Co. of America.

Tubing, Seamless Steel.
National Tube Co.

Tungsten Metal.
Vanadium Corp. of America.

Turbo Generators.
Electric Service Supplies Co.
General Electric Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Turnbuckles.
American Bridge Co.
American Steel & Wire Co.
Ryerson & Son, Joseph T.

Turntable Tractors.
Nichols & Bro., Geo. P.

Turntables.
American Bridge Co.
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Typewriter Ribbons.
Remington-Rand Business Service.

Typewriters.
Remington-Rand Business Service.

Uncoupling Device.
Hutchins Car Rfg. Co.

Undercrossings, Corrugated Iron.
Republic Steel Corp.

Underfloor Duct.
General Electric Supply Corp.

Underfloor Duct, Fibre and Metal.
Johns-Manville Corp.

Underframes, Cast Steel, Tender.
General Steel Castings Corp.

Underframes, Cast Steel, Freight Car.
General Steel Castings Corp.

Underframes, Steel.
Bettendorf Co., The.
Brill Co., The J. G.
Pressed Steel Car Co.
St. Louis Car Co.

Underground Conduit.
General Electric Supply Corp.

Upholstery, Car.
Brill Co., The J. G.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Valve Caps.
Schrader's Son, Inc., A.

Valve Gears, Locomotive.
Pyle-National Co.

Valves, Air Brake.
Westinghouse Air Brake Co.

Valves, Back Pressure Acetylene.
Oxweld Railroad Service Co., The.

Valves, Blow-Off.
Bird-Archer Co., The.

Valves, Check & Angle Steam
Sellers & Co., Inc., Wm.

Valves, Drifting.
Ardco Mfg. Co.
Sellers & Co., Inc., Wm.

Valves, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Valves, Piston.
Franklin Railway Supply Co., Inc.

Valves, Pop, Safety & Relief.
Ashton Valve Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Valves, Pressure Regulating.
Gold Car Heating & Lighting Co.

Valves, Throttle.
American Throttle Co., Inc.
Bradford Corporation.

Valves, Fire.
Schrader's Son, Inc., A.

Varnish Powder.
Aluminum Co. of America.

Varnishes.
General Electric Supply Corp.
Lowe Bros. Co., The
Sherwin-Williams Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Ventilators, Car.
Gold Car Heating & Lighting Co.

Ventilators, Shop & Roundhouse.
Carey Co., Philip, The.
Johns-Manville Corp.

Wardrobes, Rolling and Disappearing Front — (See Lockers).

Washers.
National Malleable & Steel Castings Co.
Ryerson & Son, Joseph T.
Wine Railway Appliance Co.

Washers, Boiler.
Sellers & Co., Inc., Wm.

Waterproofing Materials and Compounds.
Carey Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Water Purifying Materials & Compounds.
Bird-Archer Co., The.
Dearborn Chemical Co.

Water Softening & Purifying.
Bird-Archer Co., The.
Dearborn Chemical Co.
Graver Tank & Mfg. Corp.
Permutit Co., The.

Weather Stripping.
Tuco Products Corp.

Wedges, Automatic.
Franklin Railway Supply Co., Inc.

Wedges, Journal Box.
American Steel Foundries.
Gould Coupler Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Symington Co., The.

Weed Killer.
Q & C Co., The.

Welding, Electric.
Electric Railweld Service Corp.

Welding Machines, Acetylene.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T.
Westinghouse Elec. & Mfg. Co.

Welding Machines, Electric.
General Electric Co.
Ryerson & Son, Joseph T.

Welding Machines, Flue.
Ryerson & Son, Joseph T.

Welding Materials.
Oxweld Railroad Service Co.
Franklin Railway Supply Co., Inc.

Welding Process.
Oxweld Railroad Service Co.

Welding Rods.
American Steel & Wire Co.
General Electric Supply Corp.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T.

Welding Supplies.
General Electric Co.
Oxweld Railroad Service Co., The.

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Well Casings, Corrugated Iron.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

Wheel Centers, Driving.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Birdsboro Steel Foundry & Machine Co.
Edgewater Steel Co.
Hunt-Spiller Mfg. Corp.
Standard Steel Works Co.
Union Steel Casting Co.

Wheels, Car and Locomotive.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Illinois Steel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Cast Iron, Chilled Tread.
Assn. of Mfrs. of Chilled Car Wheels.
Graybar Electric Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Wheels, Mine Car.
Carnegie Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Standard Steel Works Co.

Wheels, Passenger Car.
Carnegie Steel Co.
Illinois Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Pullman Car & Mfg. Corp.
Standard Steel Works Co.

Wheels, Steel and Steel Tired.
American Locomotive Co.
American Steel Foundries.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Lima Locomotive Works.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Wrought Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Standard Steel Works Co.

Whistles.
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Whistles, Locomotive.
General Electric Co.
Westinghouse Air Brake Co.

Window Fixtures.
Edwards Co., O. M.
Tuco Products Corp.

Wire.
American Steel & Wire Co.
Kerite Insulated Wire & Cable Co.

Wire, Fence.
American Steel & Wire Co.

Wire, Insulated.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Co.
Graybar Electric Co.
Kerite Insulated Wire & Cable Co.

Wire, Rail Bond.
American Steel & Wire Co.
Graybar Electric Co.

Wire Rope Clips.
American Steel & Wire Co.

Wire Rope.
American Steel & Wire Co.

Wire, Telephone & Telegraph.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
Graybar Electric Co.

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Curtin-Howe Corp.
National Lumber & Creosoting Co.

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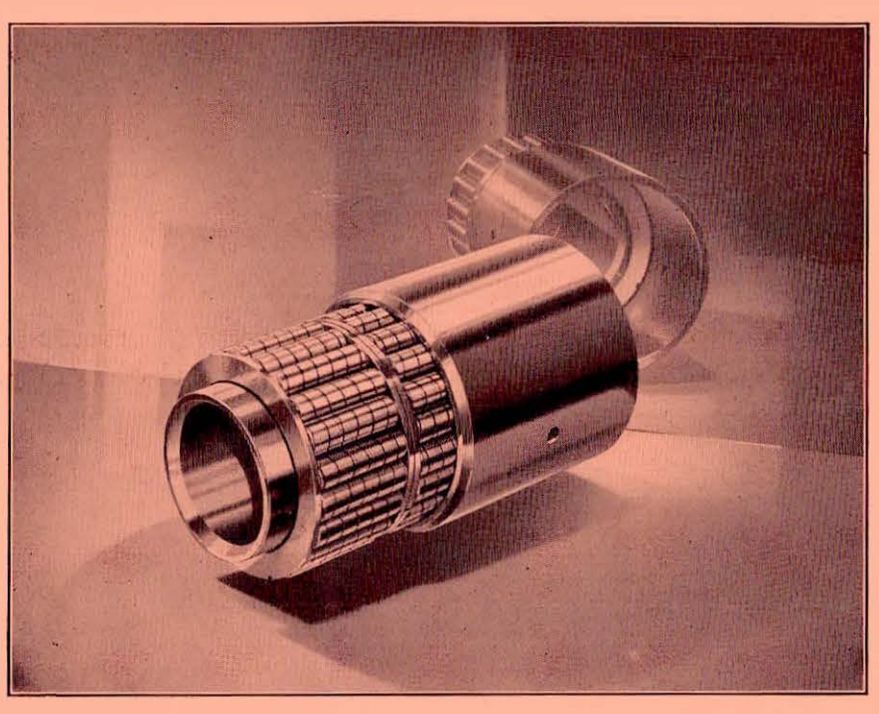

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ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

Freight Train Costs Reduced!

The forty-seven railways with annual operating revenues above $25,000,000 made a notable improvement in freight train performance in the seven-year period, 1923-1929:

Gross tons per train	increased 21 per cent.
Freight train speed	" 22 " "
Gross ton miles per train hour	" 49 " "
Cost of freight train wages, fuel, supplies and enginehouse expenses per thousand gross ton miles	*decreased* 30 per cent.

". . . There is no surer way to save money on a railroad than to increase train load and thereby cut down the total number of trains operated. In this day of improved service to shippers with an increasing proportion of the freight tonnage moving in time or scheduled freight trains, the problem of increasing train loads becomes particularly severe because of the difficulty that heavy trains find in meeting schedules. In this connection, signals assist markedly because, by reducing delays and cutting down the time spent on passing tracks, they allow heavy trains more time in productive motion and make it that much easier to maintain schedules or avoid overtime. On the other hand, it is similarly possible to load scheduled trains more heavily than might otherwise be possible with their faster schedules. Under the conditions, therefore, it seems perhaps natural that signals should be expected to permit both faster and heavier trains and to further the economies that accompany that sort of operation."*

**Excerpt from "Improvement in Freight Train Performance by 47 Roads," Railway Age, August 15, 1931. Copy on request.*

▼ ▼ ▼

UNION SWITCH & SIGNAL COMPANY
Swissvale, Pennsylvania

GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.

78

Signals Aid Modern Motive Power to Produce More Ton-Miles Per Train-Hour